Pests

AND THEIR CONTROL

1944

MAY

VOL. 12 NO. 5

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

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Pests

and Their CONTROL

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

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EDITORIAL

Sanitation in Food Establishments

ELSEWHERE in this issue is published an address that bears the same caption as this editorial. As a matter of fact this address goes back to 1941 and since that date there have arisen "stock pile" problems that make the remarks of Mr. W. R. M. Wharton take on greater significance. Wartime production demands that vast quantities of foodstuffs be made available so that with problems of production, storage and transportation many commodities are subjected to insect and rodent infestation. In addition there are problems of insect and rodent control arising out of a lack of sufficient and specific chemicals and equipment that are readily available. To such situations should be added our manpower difficulties.

Notwithstanding, foodstuffs only have usefulness as they are fit to eat or else there will be the more serious problems of ill health, sickness and even death resulting from insect and rodent contaminations. It is not our purpose to discuss conservation of foodstuffs due to destruction caused by insects and rodents, and discovered before there is human consumption. That is another story which would bring further emphasis as to the necessity of pest control services so as to avoid the loss of foodstuffs so essential to the overall war program. Our purpose, rather, is to call attention to the need of careful pest control services; that is, the technique of application of insecticides, rodenticides and fumigants should be such that we do not increase hazards leading to poisoning and resultant individual and wholesale accidents and deaths. Remedial measures as to insect and rodent control are of no value if the "cure" increases or aggravates possibilities of ill health, sickness and death.

Observations gleaned from discussions at several meetings recently, more notably at the Purdue PCO Conference, Milwaukee, Chicago, Washington, Baltimore and New York would indicate that greater care must be exercised by pest control operators. Insurance companies in particular have called our attention to careless practices. Public Health Officials recognize the handicaps that confront us with regard to being deprived of certain substances and chemicals which are regarded as comparatively non-toxic as well as manpower problems. On the other hand, there appears to be a lack of forceful reminders to pest control service employees to exert greater care in dusting and distribution of various insecticides and rodenticides as well as fumigation operations.

Comments an official of the Food and Drug Administration, "There is one matter I wish to call to your attention specifically. Within the last week we have found an instance where grain bait coated with thallium was scattered extensively over a large pile of sacks of flour. Torn bags as well as porus bag material make it possible for poison to be mixed with the flour. Storage is such that a roof leak or wetting might allow for the poison to gain entrance into the flour and thus cause potential danger to health." Whether it be thallium sulphate or any of the other toxics, it ought be considered dangerous to distribute baits in that manner.

A principal source of food contamination arises from rat feces permitted to remain in close proximity to foods. While it may not be the duty of the PCO to clean up feces, nevertheless a responsibility should rest with the PCO to insist that such conditions be rectified and not be compelled to take the brunt of criticism as is so often the case when an inspector appearing on the premises sees the unsanitary condition and the plant management shifts the blame to the PCO by some such comment as "We employ a pest control firm and he never insisted that any cleaning be done of the feces." It may be equally argued that the PCO is careless if he has not insisted that obvious rat-proofing be done so as to eliminate means of ingress of rats.

Similarly, careless dusting of roach powders especially in places where there may be possible contamination of exposed food, has been frequently called to our attention in recent months. It should be recognized that there are manpower problems in food establishments and such personnel are not as careful in their workmanship as would be employees of experience now serving with the Armed Forces. We are reminded of the story told by another Health Official who, on a recent inspection, diplomatically showed a proprietor unsanitary conditions and one of the employees happened along at the time of the conversation. The proprietor turned to the Health Inspector and said, "I want you to meet my oldest employee—he has been with me exactly **five hours.**" The restaurant involved in this case had been given a treatment for roaches but the flourine powder mixture was dusted in a manner that reflected almost "five hours" of experience as far as the PCO's work was concerned.

Modern pest control recognizes that our services call for more than mere distribution of rat baits and application of insecticides. It is essential to exterminate any immediate infestation (the individual who facetiously says that the PCO apparently wants to leave a rat or some bugs around in order to continue with services might also be worthy of extermination because he does not understand modern pest control). Maintenance and preventive services are viewed as indispensable. Responsibility in part rests with property and plant management and tenants to maintain sanitary conditions. It follows, therefore, that the PCO should have no hesitancy to be on record (in writing) that corrective measures as to any unsanitary conditions be of interest and the obligation of property management and tenants if insects and rodents be kept to a minimum. In the case of rats, it should be clearly stated in writing that rat-proofing be done and specific recommendations submitted as to where such rat-proofing is necessary.

Any pest problem involves diagnosis, prescription and treatment. Experience has taught the PCO that there are no substitutes for accurate analysis, sound technique, and skillful application.

Submitted by WILLIAM O. BUETTNER,
Secretary, National Pest Control Association.

The Rat Control Project and the PCO

THE NATION-WIDE increase in the number of rat control programs and projects, including military areas both here and abroad, is indeed a cause for gratification. Not only do these drives buttress the war effort but they are a development of rapidly growing significance to the Industry and a hopeful augury for the after-war period as well.

Meanwhile, what of the PCO? Is he taking advantage of this prime opportunity to broaden his pragmatic

knowledge of effective rat control? Is he demonstrating his willingness to cooperate with those entrusted with matters affecting public health, sanitation and food preservation?

Galen C. Oderkirk, of the U. S. Fish & Wildlife Service, in discussing the findings of the Chicago Experimental Rat Control Program at the St. Louis War Emergency Meeting, noted that though PCOs were invited to participate, not more than a commendable handful responded. From a PCO, located in a city in upper New York State, where a rat campaign has been in progress, comes this word: "The Rat Control Supervisor told me that we were the only outfit to contact him in his work and he has not met any of the others." Continuing, he says: "I have been connected with the Civilian Committee for Rat Control since it started last year and was put on the Committee without my seeking the appointment." He then explains: "We are not trying in any way to get the jump on other PCOs but we are out to learn something and I think this is a splendid opportunity to do so."

On the other hand, it is true that the PCO, sorely beset by problems of manpower and materials shortages as he is, has little, if any, time left for aught but service operations immediately connected with his own business. Nonetheless, one can only hope—and urge—that the PCO will somehow contrive to include these public rat purges among his activity musts, not alone for their important war and post-war interest but in his own as well.

Student Aid and Research Funds Established

IMPLEMENTING its desire to assist the worthy student of entomology and to further pest control research, the industry, or more particularly that segment of it which the NPCA represents, has, in the last few years, set up the following special funds for the purpose:

(a)—Purdue Student Loan Fund—a revolving fund from which worthy students may borrow money, ultimately to be repaid, as of February 18, 1944 amounted to $1,929.13 (Purdue University).

(b)—Massachusetts State College Student Loan Fund—for the same purpose as the fund at Purdue, as of March 7th amounts to $591.75 (Massachusetts State College).

(c)—At the University of Montreal there was recently started a combined Student Loan Fund and Research Projects Fund. The exact amount is not known but we are assured that there is over $50.00 in that fund. (University of Montreal.)

(d)—University of California—Through the sale of an elaborate Conference Manual, the 1943 Conference Committee has turned over to the University of California Regents the sum of $1,752.79 which is to be used as a research fund for the purpose of the pest control industry of California. (University of California Regents.)

(e)—NPCA Research Projects—Cash and commitments of over $1,000.00 are available for research pending study that is being made by a special committee that will submit recommendations at the 12th Annual Meeting to be held in Chicago, Ill. next October. (National Pest Control Association, Inc.)

Others of like mind and spirit in the Industry, apprised of this praiseworthy endeavor, will, no doubt, wish to cooperate. Send your check if you will, while the matter is fresh in mind, direct to the Fund of your selection, drawing it to the order of the name appearing in parentheses at the end of each Fund described above. Or, if you prefer, send it to the secretary of the NPCA, who will be pleased to relay it with appropriate credit to the donor. Incidentally, contributions of the nature are income tax deductible.

Lt. W. M. Gordon, Malaria Control Officer, Killed

LT. WILLIAM MORTIMER GORDON, 39, USNR, former malaria control officer and entomologist for the Naval Air Station at Corpus Christi, Texas, has been killed in action in the Southwest Pacific, according to word received by his wife, Mrs. Gordon, in March, though details of his death were not disclosed.

Detached from the Corpus Christi station in November, 1943, after two years assignment at the NATC, Lt. Gordon was a good friend of the pest control operator and attended the St. Louis War Emergency Meeting. Before he entered the Naval Reserve in 1941, he was a resident of Columbia, Mo. In the Southwest Pacific theatre of operations, Lt. Gordon was malaria control officer for a malariology unit.

Surviving are his wife and two small children of Corpus Christi, to whom we extend our deepest sympathy.

PCO Quiz—No. 3

Try to answer these true or false questions before turning to the page revealing the answers. Perhaps you might score yourselves as follows: 4 points for each correct answer. You should consider yourself above average if you score 80, and average if you score 64.

Check whether the statement is true or false.

		True	False
51.	Naphthalene acts as a fumigant for clothes moth when used at the rate of 1 pound to 10 cubic feet of space.	.....	.....
52.	Sodium silicofluoride and sodium fluosilicate are the same material.	.....	.....
53.	Moth-balls is a common name applied to para-dichlorobenzene.	.....	.....
54.	The gas given off by carbon disulphide is lighter than air.	.....	.....
55.	The reduction in the oxygen content of a tight chamber during vacuum fumigation makes insects more susceptible to the effects of a gas.	.....	.....
56.	White arsenic, arsenic trioxide and arsenious oxide are the same material.	.....	.....
57.	Carbon dioxide mixed with a toxic gas slows down respiratory movements.	.....	.....
58.	The gas from carbon bisulphide has penetrating powers superior to hydrocyanic acid and other light gases.	.....	.....
59.	Pure hydrocyanic acid gas has a distinct warning odor.	.....	.....
60.	The odor of carbon bisulphide is caused primarily by the impurities in it.	.....	.....
61.	The standard pyrethrum extract for fly sprays has one pound of pyrethrum flowers extracted in 50 gallons of kerosene or a similar material.	.....	.....
62.	Pyrethrum is not grown commercially in the United States because of the cost of labor.	.....	.....
63.	Borax and boric acid are the same material.	.....	.....
64.	The male German roach shows more resistance to insecticides than does the female.	.....	.....
65.	Adult insects have legs on the abdomen.	.....	.....
66.	Some insects have only one pair of wings.	.....	.....
67.	Cerci are jointed appendages on the abdomen.	.....	.....
68.	The circulatory system of insects is located near the top of the body.	.....	.....
69.	Insects have two kinds of eyes.	.....	.....
70.	The legs and most other appendages of insects are segmented.	.....	.....
71.	An insect has two pairs of antennae.	.....	.....
72.	Sclerites are the seams, or lines, between the plates of the exo-skeleton of an insect.	.....	.....
73.	The characteristic material in the exo-skeleton of an insect is chitin.	.....	.....
74.	Barium carbonate will not kill house mice.	.....	.....
75.	The sewer rat is a different species than the brown rat.	.....	.....

(For correct answers see page 29)

Sanitation In Food Establishments

Editor's Note: An address delivered by Mr. W. R. M. Wharton, Chief, Eastern District, U. S. Food and Drug Administration, before New England Health Institute, Boston, Mass.

MR. CHAIRMAN, Ladies and Gentlemen: I come to you today as a representative of the Food and Drug Administration of the Federal Security Agency. The Food and Drug Administration is charged with the responsibility for the enforcement of the Food, Drug and Cosmetic Act of 1938. My subject on this program is "Sanitation in Food Establishments."

Sanitation in food establishments is a predominantly important factor in the prevention of disease, and is therefore an essential achievement for public health conservation. As such, it becomes an integral part in health mobilization for defense. Since infected foods are one of the significant reasons for human disease and death, then the conditions under which foods are produced and stored deserve first attention by all public health officials.

The necessity for cleanliness—for sanitation—did not become fully apparent until after Pasteur announced in 1874 that "what the microscope showed as characteristic-shaped elements in various infected products, are self-propagating organisms, which probably furnish the essence, or an inseparable part of the essence, of all of the contagia of disease." This was the jumping off place and time for organized public health work now relatively in its infancy.

Before this time great and tragic epidemics of death-dealing disease had occurred from time to time over the ages and throughout the world. All of these could have been traced to preventable causes had present-day knowledge of the effects of sanitation and preventive medicine been known.

The black plague, which ravaged all Europe in 1664,65, and killed 70,000 persons in London alone, could have been prevented if the countries affected then had maintained a high state of sanitation, and had recognized the plague as rat and flea borne.

As late as 1906 the British Plague Commission reached a very momentous conclusion justifying strong language. Its report **mildly** stated: "as the people rise in the social scale" they "show much aversion to live in association with rats."

Typhoid fever which has taken its toll of millions of human lives is no longer the bafflingly unconquerable grim reaper it once was, though it is still prevalent in rural communities throughout the world where sanitary safeguards are lax. Where attention is given to sanitation it has ceased to be a major problem.

Cholera, number one filth disease, has flourished in the world since men began to live together in communities. In 1848 it entered this country through New Orleans and spread widely up the Mississippi. It has been pandemic in four different periods since the beginning of the last century. It is still endemic in the tropics where sanitation is less well understood and more difficult to maintain. Cholera lingers where sanitation is primitive.

In 1865 New York in its anti-cholera campaign adopted the slogan "CLEANSE, CLEANSE, CLEANSE!" and in 1885 the New York Medical Record **bragged** about the "Extra cleanliness" produced by the cholera scare, **saying** that this prevented deaths from other filth diseases.

Thus the appalling ignorance of man has brought pestilence, suffering, death, and grief over the ages. With such tragedies in the background and their reasons now fully understood, it is to be supposed that an enlightened and aroused civilization would exercise the fullest diligence and take all the necessary steps to prevent the spread of disease from man to man through the instrumentality of filth. Have we done so? Lamentably, aye, sadly we have not! This is evidenced by the fact that every year there occurs in this country preventable epidemics of filth-borne diseases. Cases of illness and death caused by the consumption of food which has been filth-contaminated occur each year. These include typhoid fever, dysentery, septic sore throat, infectious jaundice, botulism, and that group of so-called food poisoning diseases involving various forms of diarrhoea. The bulk of the trouble is due to the diarrhoeas and dysenteries.

All credit to the marvelous accomplishments of the workers in the field of preventive medicine, all credit to the splendid results in sanitation advances attributable to Federal, State and City Health departments, but we still have a long and difficult task ahead. Its mastery is at once a challenge and a duty—a challenge and a duty to shun the excreta of man and other animals in all of their insidious approaches to us. Hence health and sanitation departments should properly be charged with responsibility, with duty failure, when epidemics of preventable diseases occur in their communities.

Not until 1938 did our Federal Government assume responsibility from a regulatory standpoint to control the sanitary conditions under which commercial foods are produced. **The Food, Drug and Cosmetic Act of June 25, 1938, declares that a food shall be considered to be adulterated and therefore unentitled to inter-state commerce "if it has been prepared, packed, or held under insanitary conditions whereby it may have become contaminated with filth or whereby it may have been rendered injurious to health."** This was another step to assure consumers a reasonably decent and safe food supply.

This provision of the new Food, Drug and Cosmetic Act grew out of knowledge acquired and need recognized incidentally, during thirty years of enforcement of the old Food and Drugs Act. In many cases sanitation of food producing establishments were observed to be lacking, and in some conditions were observed to be such as to be properly characterized as unspeakably bad.

In 1937 your present speaker in an article on sanitary control of commercial bakeries stated: "It is well recognized that in the interest of public health protection and decency it is essential that food products be processed and handled under sanitary conditions. The Food and Drug Administration has made a survey of representative local bakeries operating in several larger eastern cities. Forty per cent of the bakeries covered in the survey were found operating under filty conditions."

Then as now in certain localities permit systems of sanitary control make it possible for local health officials to exercise rigid sanitary control. In other places, however, local health agencies face a difficult problem in their efforts to assure high sanitary standards in food

manufacturing plants. Lack of adequate funds and personnel contribute to the inability of such local agencies to achieve full compliance with all sanitary requirements, and in some localities no sanitary control of food manufacturing plants is exercised by local officials. I am talking of foods other than milk. In most localities milk production has been thoroughly sanitized.

Work under the sanitary provision of the new 1938 Food, Drug and Cosmetic Act has now been going on for over two years.

For the fiscal year ending June 30, 1939, Mr. W. G. Campbell, U. S. Commissioner of Food and Drugs in his annual report announced among many other actions the seizure of 6 lots of cheese because contamination with insect fragments and filth. The seizure of 252 lots of contaminated confectionery, coming from factories operating in an insanitary fashion or infested in storage in the distributing markets by exposure to insects and rodents.

For the fiscal year ending June 30, 1940, he reported seizure of 66 lots of confectionery because filthy or because produced under insanitary conditions. In the same year injunction proceedings were brought against two candy manufacturers and they were legally enjoined from shipping filthy products in inter-state commerce from their filthy factories.

In the present fiscal year the work is still going on. Bakeries, nut-shelling establishments, crabmeat packers, candy makers and other food manufacturing plants are being inspected. In many cases insanitary conditions are being found to prevail. I assure you that there is need for more cleanliness in the production of food for human consumption. There is a need for action to correct existing insanitary conditions. Under the Federal law seizures of contaminated foods from filthy factories are being made almost daily. Offenders are being enjoined and prosecuted.

I do not want to leave the impression that the conditions outlined are prevailing generally. The truth is that the majority of American food producers' manufacturing operations are carried on in a sanitary way, but there is a minority in many of the food trades which constitutes a dangerous and disgusting imposition on American consumers.

I have led up to this discussion with a presentation in brief of a picture of reality, since it is necessary to recognize that a problem exists before it can be attacked. A problem recognized is a problem half solved.

I shall now attempt to develop in a brief way the avenues through which filth may enter foods.

The first thing to remember is, assuming that a plant is already clean, that filth must be introduced from the outside, that is, it must be walked in, brought in, flown in, or blown in.

These simple facts are important. Plant construction, its proper maintenance, its equipment and appurtenances are exceedingly important as they facilitate the maintenance of sanitation, but our problem in the enforcement of the F. D. & C. Act is concerned with the recognition of the avenues of the entrance of filth to food.

Since the Food, Drug and Cosmetic Act of 1938 declares as adulterated any product which is produced under insanitary conditions which may render it filthy or dangerous to health, we have had to develop a specific technique to determine whether factory or storage conditoins exist which may pollute food products.

We make a thorough study of the possible avenues of polution, and use cameras extensively to picturize the positive findings, this for evidential purposes.

Some of the avenues of the introduction of filth into foods are:

1. Human introduction.
2. Rats and mice.
3. Animals and children allowed access to plants.
4. Flies.
5. Filth introduced by water supplies or from contact of utensils or equipment with adjacent polluted streams or bays.
6. Cockroaches.
7. Dust.
8. Filth introduced in raw materials, such as parasites, decayed matter, adhering material, mold and fungi.

1. Of all the elements contributing filth to food, the most important, is the element of human behavior. Workers or visitors to food plants may introduce filth into plants on hands, clothing and feet. They may bring germs of communicable disease which are present in the nose, mouth, throat, urinary and gastro-intestinal tracts, and which leave the body with the excretions of these parts, or they may bring filth into plants in the form of pus from sores or abscesses, or from other skin diseases. In this way associated disease germ may be directly or indirectly introduced into food. I suppose that the habit of man to carelessly soil himself with his own excrement, is a habit too well fixed to have been eradicated to the point of scrupulous carefulness in the last century since we have known that disease spreads from man to man by contact of body discharges. It is true that some individuals think little of the effect of fouling their hands or clothing and sometimes though they know they are fouled they fail to cleanse themselves. They too often continue as food handlers when they know they are sick. A Staphylococcus infection causing a running abscess on a food handler's hands inoculates a batch of cream puff filling and causes a food poisoning epidemic involving hundreds of consumers. Education, conduct supervision, and more education and more supervision, is needed to eliminate the danger of pollution of food by food handlers.

2. Of all the sources which may contribute filth to food next to food handlers, the rat is perhaps the most likely and perhaps the most dangerous. In certain sections of the country rat infestation of food plants is not only very prevalent, but the rat population in some such plants is tremendous. We have ample evidence that these conditions do exist, and of the fact that rats in food plants contribute their excreta and urine to the food and bring filth to it on their feet and bodies.

The history of the rat's role in the spread of devastating communicable disease to man easily classifies the rat as man's worst enemy in the animal kingdom.

Research workers have shown that rats and mice are carriers of Salmonella enteritidis. One worker examined 177 mice and found 28 were carriers of Salmonella. Another worker examined 775 rats and found 58 infected. The Salmonella organisms are known causes of food poisoning. One of the serious diseases caused by rats is infectious Jaundice, sometimes known as Weil's Disease. It is a disease primarily of rats and secondarily of man. About 10 per cent of all wild rats, says Rosenau, harbor the spirochetes of Infectious Jaundice. These spirochetes live in the kidneys of the rats and are excreted in the urine. Food contamniation with the urine of rats is not rare in food manufacturing plants, in this year of our Lord, 1941.

In the interest of public welfare, especially to promote national health, and therefore national emergency preparedness, food plants should be required to be absolutely rodent-proof and should be kept free of rats and mice.

3. Pet cats, stray dogs, and young children are often observed in food manufacturing plants. These agencies are a constant potential source of filth.

In one of our large Atlantic seaboard cities, in the present year, I have seen, on the sidewalks, in many instances, in a single block, the excretions of a dozen dogs, and invariably a large percentage of these show that they have been stepped in. We do not have to draw on our imagination to visualize a person with fresh dog excreta on his shoes, on his way to work; he walks into a food plant and moves from place to place, taking the fresh fecal matter of a poodle to the floor of a bakery, or a canning factory. In many factories foods are handled in containers which nest one in the other. The bottom container in a nest rests on the floor. All such containers touch the floor at some time during the day, only later to be nested in another container, half full of fresh-made food. Thus, is effected a direct transfer of my-ladies' leashed poodle's excrement to food intended for your table and my table. I recommend the prohibition of nesting utensils and containers used in handling foods in food factories. Such nesting is always a potential route of transfer of filth to food.

4. Science has amply demonstrated that insects constitute ever present danger to health of the human race. The house fly is probably the most widely distributed insect. It lays its eggs in filth or in decomposing protein material. Its favorite breeding place is a manure pile. The fly feeds and rests upon all kinds of filth. It will gorge itself on the contents of a spittoon, mayhaps containing the sputum of a tubercular person, or the pus from a discharging sinus, and then within a few minutes alight on a cream puff in the course of manufacture in a bakery. Therefore it can be readily understood that its contact with food must inevitably bring filth and dangerous bacteria to food. The answer is that the fly must be kept entirely out of food factories. Not only should food handling plants be so screened as to prevent the entrance of flies, but fly-breeding places nearby should be diligently sought out and destroyed. In plants where it is necessary for doors to be opened frequently for ingress and egress, some type of prevention of fly entry at such times should be employed. A fan placed over the top of the door and pointed downward, creating a heavy breeze has been found to be effective. Likewise, there are several ways of electrifying screen doors so as to kill flies that alight on them.

5. The problem of the introduction of filth in food through the use of polluted water is well understood and needs no mention here. When plants are located on polluted streams, or polluted bays or lagoons, great care is necessary to prevent the introduction of filth from such sources. I personally have seen food utensils washed in bay water with floating pieces of human feces nearby. Even washing down of platforms and docks of a food plant with polluted bay water constitutes an almost certain means by which pollution will later gain its way into food.

6. Roaches are frequently found in food plants. They are omnivorous, feeding on almost any dead animal matter, and food materials of all sorts. They soil everything with which they come in contact, leaving a nauseous, roachy odor. This odor comes partially from the excrement, but chiefly from a dark-colored fluid exuded from the mouth and scent glands of the insects. Roaches hide during the day in darkened sheltered places where they collect in large masses. Such hiding places are usually cracks and crevices in walls and floors, around sinks and water lines and other damp locations. Roaches leave pellets of excreta in food over which they run. The female carries her eggs in capsules. They are dropped at hatching time. They may be dropped in food materials being prepared. Investigators have shown that cockroaches feeding on the feces of persons having infectious disease may pass infectious material in their own feces for a considerable time and without lessened virulence. This has been definitely proven in the case of streptococci and straphlococci. In addition, an important factor in the distribution of filth and disease germs by cockroaches is that they transfer such products mechanically on their hairy legs and bodies to the foods on which they crawl when they emerge at night. We have found in a number of instances the legs, wings, and other parts of roaches in prepared food. Cockroaches are definitely to be regarded as a sanitary menace and a dangerous one. They should be entirely eliminated from food establishments. Warfare against roaches involves cleanliness, elimination of breeding and hiding places, fumigation, poisons and traps.

7. We shall now consider dust as a possible contributor of filth to foods. Streets adjacent to plants and other plant surroundings are often abiding places for filth contributed by human beings, animals and birds. These furnish the material to form dust.

I recently visited a bakery in a large city. This bakery fronted on a paved street. The street was one of heavy traffic and apparently had not been swept or flushed in many weeks. The grinding processes of vehicles had rendered the accumulation of horse manure and other debris present in abounding amount, to a fine powder. It was no doubt intermingled with the dried sputum of passers-by. Only a slight wind was necessary to blow this material through the open window of the bakery. Dust particles have been proved to carry tubercle bacillus, many varieties of cocci, the colon bacillus, and occasionally other micro-organisms.

8. Filth may gain entry to foods through the use of improper raw materials. Such raw materials may be filthy, putrid, or decomposed in whole or in part. Moreover, they may be parasitized, weevily, wormy, maggoty, moldy, or they may contain plant lice or plant mites. The utmost care in the selection and use of raw materials is essential to prevent their contributing filth and decomposition to food.

In addition, we should not forget that there exist other and more obscure and non-recurring avenues of pollution and bacterial infection in commercial food plants.

I have said that the Food and Drug Administration is searching out the avenues of filth entry into food. I shall recite two recent experiences:

An inspector of the Food and Drug Administration visiting a bakery discovered that a lot of flour in use there had some weevils crawling on the bags. He secured a sample of the flour and on carefully sifting it through proper screens, was able to recover from a single bag a quantity of 4 ounces of round white particles, slightly larger in size than the flour particles. These proved to be pellets of weevil larvae excreta.

In another case an inspector visiting a candy factory, discovered that this factory used starch for molding candy bonbon centers, as do many such factories. The starch in the plant under investigation appeared some-

what grayish in color. The inspector inquired of a workman how long the starch had been in use. He learned that the same starch had been used over and over again for candy-molding purposes for three years. The plant under inspection was rat-infested. The forms holding the starch were never covered and the inspector concluded that this starch would show evidences of rat droppings. He therefore collected a sample of the starch and on careful sifting found the material literally impregnated throughout with rat excreta and rat hairs. Of course candy molded in such material took up portions of the filth.

Filth and indices of filth can actually be found in filth-contaminated food. You are familiar with the "Howard" method of mold counting. Mr. B. J. Howard of the Food and Drug Administration developed the method. It gives an accurate index of the amount of rotten tomatoes used in making tomato juice, tomato puree and the like, as there is a direct correlation between the mold count and the quantity of rotten material used in manufacture.

In examining food products for filth we first prepare the sample so as to make it possible to separate and recover any evidences of filth. Various methods are used, as for example, in the case of bakery products, the sample is digested with pancreatin which converts starch into dextrine and maltose. This treatment follows a treatment of digestion with water in order to thoroughly break up the product. The pancreatin has no noticeable digestive action on insects or rodent hairs. After thorough digestion filtration recovers any insect parts and rodent hairs present. These are counted and classified and furnish positive indices of filth contamination.

In the bacteriological field we of course use E. Coli as an index of filth and regularly take legal action against crabmeat, for example, if we find E. Coli and confirm it as of fecal origin.

We have now shown that a problem exists; we have resolved the problem into its fundamental causes; we have shown that the problem represents a serious menace to public health and welfare. We next come to the question of a means for its solution. Food manufacturers must be taught to recognize objectional sanitary conditions; prompted to maintain interest in their correction, taught how to do so and thereafter to maintain vigilance to prevent recurrences. As health officers we must

FUMIGATION NEWS

ZYKLON DISCOIDS

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Anyone engaged in fumigation work should have a thorough knowledge of the Schafer Prone Pressure Method of Resuscitation. The expert carries this out so smoothly and with such finesse that it is easy to get the impression that it is simple. However, the Pest Control Operator who tries it himself will soon realize that it takes practice to achieve routine precision.

This method of reviving a person is described and illustrated in the ZYKLON DISCOID FUMIGATION MANUAL (available on request) and also in the leaflet enclosed with each case of DISCOIDS. It is a good idea for groups of P.C.O.'s to get together within their own organization at regular intervals for practice.

Although the P.C.O. may never need to utilize his knowledge and experience in his own work, this particular type of first-aid treatment is valuable to have at one's fingertips. It is a prerequisite for many duties in civilian defense. Many industrial accidents and mishaps which occur on the streets may be treated by the Prone Pressure Method. The P.C.O. who is familiar with it may some day have the opportunity of saving a life.

Every P.C.O. Should Be Adept at the Prone Pressure Method of Resuscitation.

RATS CONTROLLED WITH CYANOGAS IN SOUTH AMERICA

As prevalent as rats are the world over, just as universal is the use of CYANOGAS* for their destruction. A town in Ecuador has for some time been using CYANOGAS A-DUST pumps for more than satisfactory fumigation service, according to the General Management of Sanitation.

The job of keeping the city rat-free is handled by several squads, each made up of an Inspector and two Operators, who are constantly at work fumigating culverts, sewers, burrows and hiding places in the wharfs, markets, factories, bakeries, supply houses and other rat infested places. Most effective results have been achieved through the use of CYANOGAS, it is reported.

*Reg. U. S. Pat. Off.

make insistent demand for complete correction. If this fails, our next weapon is to take consumers in our confidence by publicity. Consumers' indignation rising to a revolutionary seething point will, I assure you, be effective. What food handlers in this country need is to become more cleanliness conscious. Let's bring about a change in habits of thought on the subject. Let's convince or convict. For to be convinced is to be cured. To be convicted is to be confined.

A short time ago I heard a prominent labor leader in a radio address say: "Strikes have the advantage, among others, of centralizing attention of the workers on their problems."

To all health officers throughout the nation, I suggest that we go on a strike against all the disgusting and dangerous insanitary practices that exist. I suggest that we show our indignation at carelessness in food plants by a hard-boiled attitude in the application of remedial legal actions.

Recently during the course of a talk to a large food trade organization I stated that I presumed that there were present in the audience a considerable number of production managers and asked for a showing of hands. There was a large response. I repeated the question as to sales managers and as to traffic managers, with the same result. I then asked for a showing of hands of the sanitation managers of the food plants represented. There was no response. None of the dozens of large food plants represented had designated a single individual with authority and responsibility to maintain sanitation in these plants manufacturing an important food product for nation-wide distributoin. Obviously in all of these plants sanitation was everybody's business and everybody knows that everybody's business is nobody's business. I suggested that each company represented designate a single individual to be held responsible for keeping the plant clean, responsible for finding any avenues of filth and pollution, and of eradicating them entirely, and to be eternally on guard thereafter to avoid recurrences.

My final suggestion is that health departments, experiment stations, and state colleges establish a short course in sanitation and invite food producing establishments to send their factory managers to learn the significance of sanitation and the necessity for closing all avenues of polluting contamination of their products and how to do so.

Let us bring about in the food industries recognition that a sanitary problem exists. Let us engineer a centralization of attention on the problem. Let us provide the means of securing the knowledge of how to solve it. Let us instill in food producers and food handlers the idea that cleanliness is the price to pay for safe and clean food.

This Looks Like News: Rat Bites an Ashman

From now on Harold Harris, 43, of 705 E. Pearson st., a city garbage collector, is more than ever a determined enemy of rats.

Monday afternoon Harris was working in the neighborhood of N. 24th st. and W. Auer av. with a crew. He was about to dump a can of garbage into a trailer when a big rat jumped out of the can and bit him below the left eye and on the left cheek.

The wounds were dressed by a city physician.

—*Milwaukee Journal.*

Entomologists of North Central States Meet

THE 23rd Annual Conference of the North Central States Entomologists met at the University of Illinois, Urbana, Illinois, March 30 and 31, and was attended by over 200 entomologists, including eight or ten commercial pest control operators. This annual conference is an informal affair, prepared papers being forbidden. As a result, the sessions are essentially round table discussions giving everyone freedom of thought and speech.

Although the topics discussed were largely problems of plant and animal pests, much of the discussions were of interest to commercial pest control operators.

The opening session was addressed by Prof. E. O. Essig, head of the Department of Entomology, University of California and President of the American Association of Economic Entomologists. He spoke of the responsibilities of the American Association of Economic Entomologists in connection with the war effort. One thought which he expressed, as a result of inquiries and observations, was to the effect that entomologists in the Sanitary Corps and Medical Corps who had had good basic training in Entomology were giving equally good service as those with specialized training in medical entomology. We probably could go further and show that entomologists with basic training may operate as commercial pest control operators as well as those with specialized training in household and structural pests. In either case, they probably would not have the experience to immediately engage in satisfactory pest control service, unless associated with a commercial operator before completing the college program. Along this line were remarks made by George L. Hockenyos of Springfield, Illinois. He spoke of the shortage of help and on top of this, increasing calls for pest control service—partly the result of increased women employment, resulting in poorer housekeeping. He stated that he had good results by the employment of college graduates in entomology.

One feature of the conference was a discussion of insecticides as substitutes for scarce priority chemicals. Of special interest was DDT (Dichloro-diphenyl-trichloroethane), the new "miracle" insecticide, which was discussed by P. N. Annand, W. E. Dove, E. R. McGovran, C. H. Richardson, and others. Its immediate value as a louse control has been fully demonstrated. Two million treatments were made in southern Italy and doubtless saved thousands of lives from typhus. Even if of use for no other purpose, its value as a control of body lice which are carriers of disease would fully justify the interest being taken in this chemical. Extensive experiments are under way and there is evidence of its value and usefulness in the control of various insects. On the other hand, there is evidence it is less effective on such insects as plant lice or ephids than nicotine. One of the valuable features of this material, not found in other contact insecticides, is its long residual contact effect. Studies to date indicate that it is safe to man when applied to the skin in dry form. As an internal poison it is less toxic than the ordinary insect stomach poisons.

Robert I. Metcalf gave an interesting discussion of mosquito control by the use of the airplane for dusting Anopheles breeding places with paris green. Applications of 22 per cent paris green, using talc or soapstone as the diluent, were made once a week. Control was obtained where there was no plant growth in the water when used at the rate of .2 pound paris green per acre. Where the

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A CITY RAT CONTROL PROJECT

By GEORGE W. DYAR, *Biological Aid, Cleveland, Ohio*

Editor's Note: This paper was given at the 8th Annual PCO Conference, Purdue University, Lafayette, Indiana, January 19, 1944.

THE purpose of this paper is to give you a few brief details of the Cleveland Rat Control Project, what has been accomplished in the first year of its operation, what is indicated for the future and particularly the place of the Pest Control Operator, in such a program.

weed growth was moderate .6 pound was necessary, and where the water was covered with heavy weedy vegetation .8 pound per acre was necessary for best results.

W. E. Dove reported in the development of mosquito and fly repellents. A material, known as "6-2-2", provided protection against mosquitoes and flies at least 4 hours. This new repellent is a mixture of three chemicals which have shown repellent value for disease carrier mosquitoes, annoying mosquitoes, and flies, respectively.

Preventive control measures was the subject of a discussion led by G. C. Decker and G. E. Lehker. Although the remarks dealt largely with plant and animal pest problems, the importance of prevention is a subject vitally important to pest control operators and is one which might well be considered for the region PCO Conferences.

Ira Hatfield told of the work of the Monsanto Chemical Corporation in testing chemicals for powder post beetle control and the successful results from the use of pentachlorophenol.

Recent Developments and Substitute Materials for Cockroach Control was the subject assigned to Geo. E. Gould. Pyrethrum marc showed no toxicity to German roaches but when added to sodium fluoride it excited the roaches as does pyrethrum. Two new dusts, thiocyanate dust (Rohm and Hass) and nitrated hydrocarbon impregnated in pyrethrum marc (John Powell & Company), gave good kills. Continued experiments with borax and boric acid dusts showed good kill when run 10 days, in comparison to rather poor results obtained a year ago when the tests were run only 4 days—indicating that these materials are slow acting. The boric acid dusts gave better kill than did borax. With DDT a good kill was obtained with 25% dust and a fair kill with 10% dust. In this connection, W. E. Dove reported that DDT in oil as a spray gave good kill of all species of roachs, including the German roach, and showed considerable residual effect.

A discussion on how the entomologist can aid the pest control operator in providing efficient service to the public was opened by J. J. Davis. He called attention to the importance of cooperation, but also showed the need and value of registration of pest control operators in the different states, education for the PCO, necessity of educating the public, and especially the need of educating medical men and public health officers in the importance of insect control to health and good living.

The proceedings will be mimeographed, and we understand a copy can be obtained by sending $1.00 to Dr. C. L. Metcalf, Chairman of the Conference, Department of Entomology, University of Illinois, Urbana, Illinois.

The next conference will be held at Purdue University, Lafayette, Indiana, in March, 1945.

This Project is under the supervision of the Rodent Control Division of the Fish and Wildlife Service, United States Department of the Interior. It is sponsored by the Food and Drug Administration of the Cleveland Division of Health. Many communities in the area surrounding the city proper are contributing to the project and it is known as the Cuyahoga County Rat Control Project.

First, it must be understood that Cleveland's Rat Control Project is not a "Campaign" in any sense of the word. The Health Department asked the City Council for funds to cover this project and that assurance be given that funds would be made available for an initial five years in which time it is hoped to prove the value of such work that it will become a continuing project.

The first step taken was a survey of the business area to determine where the rat infestation was most serious and the menace to property, particularly to food products, most apparent. To date approximately 400 business establishments have been given a complete ground line inspection and all pertinent data have been recorded and filed, cross indexed, etc., for accessibility. Perhaps you would be interested to know how a survey inspection is made, and also what is meant by the term "ground-line" inspection. It was evident, soon after the survey was started, that the principal means of ingress of rats to the buildings is from 3 feet above ground to points below the surface of the ground and, that, for the most part, the rat-proofing of basement exterior walls and floors needed most immediate attention. Therefore, it was decided to inspect only floors at or below ground level. However, rats in seeking food, may infest food handling places to great heights above the ground, so any establishment having a food handler located anywhere on floors above the first is given a separate survey inspection of the immediate vicinity of the food handling area. This is besides the general inspection of the ground floor and basements of the same building. As an example rats were found infesting a restaurant kitchen on the 12th floor of a commercial building to which height the inspection indicated they had climbed up the air ducts of the ventilation system.

The original plan of the survey called for a complete coverage of the main business area of downtown Cleveland. Naturally, the time involved in making such a survey is great. However, a typical area, covering a section one city block wide and about an eighth of a mile long, was completed late in the summer. Some very interesting facts came out of this area survey. Only one building was entirely free of rats or any recent signs of the pests. The managers of this property have been rat conscious for years, and have been very careful to maintain the building rat-proof. This survey showed that of 55 food handling establishments 72 per cent of them were rat infested. Thirty-nine of these food handlers were eating places from drug store soda fountains to swanky restaurants and night clubs. Of this number, 80 per cent were rat infested.

In one building having a large restaurant in its basement, a PCO is said to have taken out 1,000 rats a year for the past 7 or 8 years. A grocery in another non-rat-proofed building was throwing away a bushel

of rat contaminated food every morning, and this had been going on for many months. Several PCOs had attempted unsuccessfully to control the rats here. They had had no cooperation. Another restaurant had fought rats, but there were still plenty left which sported in the show windows in evenings and drew large crowds of theatre goers. The management had hired PCO after PCO in an attempt to control the pests by usual methods. The survey discovered a source of supply in an adjoining basement, which had been unused for a score or more of years, by anything but rats. The rat colony here had tunneled out under the floor until there was no supporting earth to a depth of two feet in some places. Naturally, the floor had caved in.

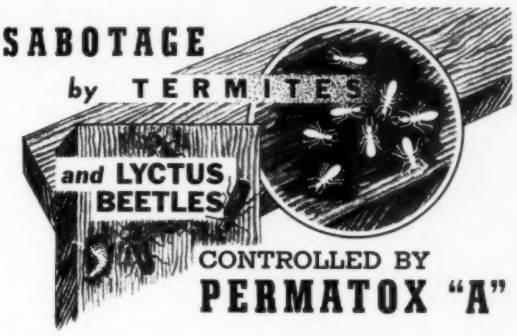
Considerable discussion is being devoted to the Survey phase of the work to show you how important it is to get a true picture of conditions before beginning the actual control work. In the area surveyed, approximately six large rat breeding areas were located. Immediate steps were taken to get buildings affected ratproofed and the rats in the buildings eliminated by a licensed PCO. This brings us to the second phase of the project, RAT-PROOFING.

The survey showed, without question, that the principal responsibility for the conditions favoring the rats rested with the property owner. Contributing factors such as exposed food, unsanitary conditions as poor garbage and rubbish disposal systems, etc., were considered secondary to getting the property in a rat-proof condition. Thus an important part of the survey inspection is to determine who is legally responsible for the building in question. Conferences were held with individual property owners, managers or others whose duty it might be to carry out the recommendations.

I wish I were able to say that immediate, voluntary action was received on the part of these business men. However, such was not the case. And remember, only those who had outstanding rat infestations were approached. Places where the tenants were losing hundreds of dollars in material, to say nothing of loss of business due to having rats seen by customers. It is only fair to say the cost of compliance with recommendations runs into a sizeable figure in most large commercial office and business establishments.

Resort to legal action became necessary in these cases. A city ordinance makes it an offense to maintain a premises in a rat infested condition. The city's method of handling non-cooperators is to issue specific orders from the Department of Health, on a fifteen-day time limit, to do certain specific things to rat-proof the building. Work must be commenced on the major items of the orders, within the time set. Extension of time may be given if there are indications that such work will be undertaken within a few days of the expiration of the time set. In the beginning the time given was often extended to 90 days. It was found that the average property owner failed to act until the very last, if he took action at all. As a result, the time limit was reduced to 15 days in all cases and extended as the case warranted.

If no action is taken on the orders and no good reason given for such negligence, a summons is requested for the responsible person to come to Police Court and talk over the problem. The Police Prosecutor explains the seriousness of the situation and gives the person to understand that the action must be taken at once or an arrest will be made. To date, it has not been necessary to resort to arrest as the property owner realizes the



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resulting publicity would be much more expensive than the cost of complying with orders.

We wish to make it clear that we do not believe that prosecution is desirable except in extreme cases. The city's policy is to seek voluntary cooperation in all situations and to give the property owner every consideration up to the time he actually refuses to take action.

Once a property owner takes action, as engaging a contractor to lay a floor, or point up walls, or designates an employee to do the necessary work, we make frequent inspections as the work progresses to be sure it complies with the city's desires. Owners have expressed appreciation for this free service.

No single phase of a vast program such as Cleveland's Rat Control Project can be pursued to the exclusion of the others. The survey must be done a few days at a time and worked in with other business.

Numerous reports and complaints of rat infested business establishments, apartment houses, and dwellings are received by phone, personal visits to the office and from other inspectors in city services and reports of bad infestations by cooperative PCOs. Wherever an inspection is made of a premises, such inspection is recorded on a standard survey form to become a part of the survey file. If a premises houses a rat infested food handler, rat-proofing orders are served on the first inspection.

Early in the program, it became evident that no single individual or two or three could hope to cover all phases of this project simultaneously without having the feeling that only a relatively few establishments could be reached. Each person contacted on the subject of Rat Control had to be "sold" on the seriousness of the problem and stimulated to take active part on his own place of business. The complete ignorance of the "man on the street" and the "man in the basement" and his "boss in the office" concerning rats was astonishingly evident everywhere. It can be seen that telling the same story over and over, to each building manager, building maintenance man, custodian, restauranteur, contractor and his helper, in short to everyone who might take a part in the project, would wear down the most talkative inspector. By now, you're probably wondering what all this has to do with my subject. Out of the need for a means of reaching many more people, especially contractors and maintenance people developed the SCHOOL OF RAT CONTROL. It is a meeting place in downtown Cleveland where a free course consisting of four two-hour lectures covering the subject of Rat Control is given. The course discusses the Need for Rat Control, Rat-proofing of buildings, the Usual Rat Control Measures. Live rats are used to demonstrate biology and habits of the pest. Movies, slides and diagrams are used to illustrate Rat Control methods. Numerous pieces of mimeographed and printed literature are given to students in the course. At completion of the four lectures, an attractive Certificate of Attendance is awarded. To date, 23 classes have been held with a total attendance of 601, including school teachers, building superintendents, maintenance men, property owners, public officials, and PCOs.

The results of the School of Rat Control will be far reaching. For instance, a large chain 5 & 10 store sent a representative and upon completion of his course he developed a leaflet on rat control procedures, stressing the storage of merchandise in basements and rat-proofing which went to 200 stores in 6 states. A nationally known grocery company and several similar chain stores sent representatives who immediately commenced rat-proofing stores which had been losing thousands of dollars of merchandise over many years. These companies do not hesitate to call us in on severe cases for action against property owners, and for final checkups of rat-proofing jobs. On many inspections preliminary rat-proofing work has been done under direction of a person trained at the School of Rat Control. Thus the burden of getting the initial work started is lightened.

The Office of Civilian Defense has been most cooperative in placing 14 trained speakers at our disposal. The speakers have attended special classes of the School of Rat Control to give them material for 10 to 20 minute talks to Block Plan meetings, and numerous gatherings wishing to hear the story of the Rat. This feature of the Educational Program has started in the past few weeks and already several hundreds of persons have heard talks by these speakers.

Special classes of the school have been held for city service employees and more are planned for specific industries, as bakers, butchers, grocers, etc.

Another important part of the project is the educational program which strives to get the story of the Rat into the home. This is accomplished by lectures, news stories, school projects, etc. Work in the Public Schools has been slow in developing but the coming year promises definite advance in this phase with the recent placing of a specialist in charge of this program.

It is your speaker's firm conviction that any municipal Rat Control Project must be supported by an educational program which will acquaint John Q. and especially Mrs. Q. with the fact that such things as uncovered garbage cans, garbage mixed with rubbish and general backyard sanitation are very important considerations if rats are to be eliminated from residential districts. Our children should learn in school the story of the Rat and how carelessness at home may lead to serious rat problems in any community. Education must open the eyes of the public to the seriousness of the community rat problem and make it desire to take an active, organized part in Rat Control Projects.

A hard nut to crack in any Rat Control Project is the censorship of this subject by the local press. Cleveland newspapers have been outstandingly cooperative in recent months as the Rat Problem has become a subject of conversation by the public.

So far nothing has been said about the actual extermination of the rats themselves. This is where the PCO enters the picture. At the time rat-proofing begins in an establishment, an order is given to eliminate the rats which states that the services of a licensed PCO must be engaged. Instruction is given to advise the city office who is doing the work, and we check with the exterminator to determine what procedure he wishes to follow, times of treatment, etc. On several occasions we have indicated fumigation. An example might be the case of the fish processing plant where a case of Spirochetal Jaundice was discovered. The plant was closed down, remodeled and rat-proofed according to the city's specifications. It was disinfected and fumigated by a PCO to kill insects which might be carrying the disease as well as rats and mice. This was one of the early cases. It was encouraging that the owner of this plant became so interested in the rat problem that he attended the School of Rat Control many months after his place had been rat-proofed.

Every attempt is made to eliminate the rats as each breeding area is rat-proofed. The City of Cleveland feels

this is definitely the field of the PCO and the cooperation they have given has been most encouraging.

Now there is a phase of this Rat Control—PCO relationship which will answer, in part, the question in the minds of most of you. Won't the Cleveland Rat Control Project put the PCO out of the rat business? My answer is, most definitely NO. On the contrary, it will give him a great deal more business, and what is just as important, the satisfaction of being able to approach more closely the ideal . . . true extermination of rats on his jobs.

Recently, a very interesting case came up wherein a progressive PCO in Cleveland obtained a contract bid on by several other firms to handle a large dairy. The usual insect pests were present but the problem was complicated by a bad rat infestation in some very old buildings. This PCO was awarded the contract in spite of the fact that his bid was considerably above the lowest bid. Then why did he get the contract? Because he went to the trouble of calling in the Federal Rat Control Inspector from the Department of Health, to go over the situation and advise him, on the spot, of the work necessary to rat-proof the buildings. This was done in the presence of the plant manager. Result, he discussed the situation with the Chief of the Food and Drug Administration, and asked his advice. His suggestion that the services of his Rat Control Inspectors are free and available to all PCOs alike impressed the plant manager that the high bidding PCO must certainly be interested in doing a satisfactory job, and that was what the plant management desired most.

The feeling of the average business man toward his PCO is that, while he does a good job on insects, his control of rats is far from satisfactory. In some cases he puts up with the PCO's rat work only because he knows of no better method. He tries first one and then another, and the sum total is . . . he still has rats. You and I know why he has them, simply because there is little effort to stop the ingress of rats. Rat-proof the building and the Pest Control Operator should be able to give total control . . . extermination. And then he will have no difficulty fulfilling his contract to keep the building free of rats. A recent case comes to mind involving a large hotel, one of a chain, which has been rat infested for years in spite of service by a very reputable PCO. Of course, the PCO didn't have good cooperation . . . plenty of garbage available, unprotected food, unscreened windows and all that. But the engineer from the home office never questioned for one minute that a good PCO could exterminate all the rats the minute all outside openings were closed. He put a terrific responsibility on the exterminator to get all the rats in a 12-story building having thousands of places where rats could harbor inside. As long as you call yourselves exterminators, the public will expect you to live up to your name. Any project which aims at building rats out will make your work simpler and will more likely result in your giving satisfaction.

We realize that we have done little to control rats on dumps, parks, and along the waterfront in the past year. However, our survey has shown that the worst rat infestations are not alone on the city dumps and other places mentioned, but right in the heart of the city where colonies of hundreds, and in some cases a thousand rats are causing thousands of dollars worth of damage, and are definitely a menace to public health. It is felt that the breaking up of one of these colonies

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TERMITE INTERVIEW

Questions propounded at the Termite Clinic, War Emergency meeting, National Pest Control Association, St. Louis, Missouri, October 27, 1943, by Mr. Bert Lewis, Chairman of the Termite Committee. Answers by Dr. Thomas E. Snyder, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture, New Orleans, La.

* * *

Editor's Note: Readers not entirely familiar with the 1-2-3-3½ principles of subterranean termite control, to which frequent reference is made in this article, will find the National Pest Control Association bulletin on termites, subjoined to the article, of explanatory interest. Attention is called also to Farmers' Bulletin 1911, U. S. Dept. of Agr., which substantially refers to these 1-2-3-3½ principles, though not in that terminology.

CONSIDERING that the majority of the commercial termite operators realize that breaking contact between soil and wood, either by reconstruction or the use of soil poisons, is the major objective in termite control, let us confine this interview largely to things that can be done when this major objective is impractical.

Question 1—Do you believe that the procedures of termite control have been materially improved, in say the last six years? In other words, are the legitimate operators doing a better job?

Answer 1—For most termite jobs it is economically practical to incorporate the number 1, 2, 3 and 3½ steps or principles of mechanical and chemical insulation for the control of subterranean termites. If these standard procedures are adapted in a common sense manner to the special needs of each infestation there should not be any necessity for controversy developing because of different methods of procedure in various sections of the country, or indeed anywhere in the entire world. These principles were purposely drawn up in so broad a manner as to make it possible to include any effective, practical method. **Special cases should not be given undue importance.**

Many operators have adopted better procedures; however, there is still room for improvement in the case of some operators. I would not hesitate to recommend to the public the services of some operators in any section of the country. The integrity of a firm and the thoroughness of its work is better than any bond or guarantee; most guarantees are mere maintenance service agreements. A poor, local representative is a menace to the reputation of any firm, national in scope. Unethical firms and firms charging very high prices for very poor work can jeopardize the good name of the entire industry. Too low prices or "cut-throat" competition by operators doing poor work likewise is to be condemned. It should be thoroughly understood that the Bureau of Entomology and Plant Quarantine has no regulatory jurisdiction either with regard to procedure or prices. However, we are interested in seeing that procedure is improved and in protecting the public against unethical operators.

(Assuming the answer is in the affirmative):

Question 2—To what factors do you attribute this improvement?

Answer 2—The termite control industry was at a low ebb in 1934, at the time of the first St. Louis meeting. However, the high character of the officers of the National Pest Control Association did then and has continued to inspire confidence in government officials and officers of educational institutions. This has led to active cooperation **on the job.** The termite clinics, first instituted through the foresight of Professor J. J. Davis of Purdue and now conducted at universities in various sections of this country and Canada, have been of considerable assistance. Finally, the adoption of the 1, 2, 3 and 3½ principles of termite control has led to a helpful standardization of procedure. Furthermore, the general public has also been educated and is more demanding through the seeking of competitive bids and comparing procedures in an effort to obtain the best, not necessarily the cheapest.

Question 3—Is there any research being conducted at this time that will influence or materially change or improve the methods of termite control, that are not being used by commercial operators?

Answer 3—I cannot answer the last part of this query! It would require an army to check up on commercial operators in various parts of the country. Furthermore, this type of work is not within our field; we are engaged in research and experimentation, some of which is of practical value to your industry. In the southern states, commercial operators should give more attention to the results of research on structural and chemical insulation.

As part of the country-wide program of this Bureau, representatives of the New Orleans laboratory have continued to give advice on the job to regional directors of the National Housing Agency, regions IV and VIII, as

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and the resulting rat-proofing of a business establishment protecting a score or more of merchants is a far greater step in our project than the treatment of any one of a half dozen dumps. Don't get the idea, now that we intend to let our dumps go on breeding rats without control. Upon my return to Cleveland, a training course on dump control will start at the School of Rat Control, and attendance by many city officials has been assured by surrounding communities.

The task of controlling rats, in the open, that is, on dumps, in parks, in river banks, etc., is great and entails periodic inspection and treatment, and thus is, at best, only temporary and expensive for the results obtained. In these locations, the economic-loss potential of the pests is low. The control of rats by rat-proofing in infested business establishments, apartment houses and residences, is specific, and permanent, and while costly, brings immediate financial and esthetic benefit to each establishment treated. Moreover, both the owner and operator are very much aware of these benefits. Where the number of personnel available for rat control work is small as in Cleveland, the efforts of such workers must be directed where the greatest actual benefit may be affected immediately.

It is the feeling of the Department that the Cleveland Rat Control Project must be of a continuing nature, that it must include rat-proofing, and rat elimination. It must be accompanied by an educational program to acquaint the general public with the seriousness of the rat problem and create in the public mind a desire for a more sanitary community. It is a project which should have the wholehearted backing and cooperation of every PCO.

well as to architects and project managers, as to the most effective details for the construction of termite-proof foundations for both permanent and demountable war housing projects as well as other construction in the states of Alabama, Florida, Mississippi, Louisiana, Arkansas and Texas. Some success has been attained in correcting the more serious errors such as earth-filled-in porches and steps adjacent to the main building, insufficient clearance between the earth and untreated woodwork, and the improper use of substitutes for coal-tar pitch as an insulating material.

Studies of the relative influence of ventilation, temperature, humidity, soil moisture and wood debris in the soil on the tube building by subterranean termites have demonstrated that soil moisture is the most important factor. Soil moisture and humidity can be governed to a large degree by drainage aided by ventilation. Wood debris is not a necessary factor; it should be removed, however, because its presence undoubtedly attracts termites.

Even when there is poor ventilation, foundation timbers normally contain but little more moisture than air-dried wood; not in sufficient quantity to sustain life of subterranean termites.

Quite a large number of chemicals are suitable as soil poisons to be used as a supplement to structural insulation; such poisons will give effective protection for 8-10 years. The texture of the soil must be considered for the best results; certain chemicals are not effective in heavy soils; other factors affecting the length of service of soil poisons are the moisture content of soils and the effect of different climates. Oil solutions, water solutions, emulsions, or dry crystals all have their uses.

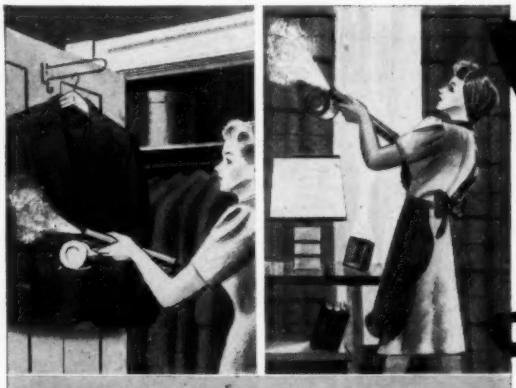
The Bureau of Entomology and Plant Quarantine is also conducting much research work which does not relate particularly to the prevention of termite damage to the woodwork of buildings as a part of our contribution to the war program. Such work relates to studies of the relative effectiveness of wood preservatives and methods of preserving timber, of termite-resistant woods, poisons for insulating boards manufactured of fiber, the termite-proofing of fabrics for sandbags, tents and uniforms as well as preparing lists of termites occurring in the various regions of our present global warfare for use by the military forces. The termite collection, card catalogue, species index and bibliography under subject headings serve as a fingerprint identification file for the termites of the entire world.

Question 4—Is the commercial operator justified in refusing to do a job when it is economically impractical to make such structural changes as the operator would like to have made, in order to do the job that he would like to do, or should he proceed as best he can with what he has to work with?

Answer 4—Yes, he is justified in not giving usual standard contract, particularly in states where licenses are required; some operators refuse job, others write a special contract putting all of the responsibility and risk on the owner of the building.

Question 5—Has soil poisoning been proven sufficiently effective that a termite operator can lean on it heavily or depend entirely on it, as his main objective in termite control?

Answer 5—Soil poisoning must be considered primarily as a supplement or an adjunct, usually of prin-



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ciple No. 1, sometimes also of No. 3 and rarely of 3½. Soil poisons of various types have given effective service for 8-10 years. No one of these principles, considering a large number of cases of infestations can stand alone.

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Question 6—Will you give us your opinion whether soil poisoning would have more value placed on the inside of the foundation rather than outside, and would it have a tendency to make the chemical more potent by being away from the rains and leaching?

Answer 6—This might vary with the type of construction and infestation. The operator must use common sense. In some cases treating the inside of the foundation is all that is necessary. In our experiments we have only occasionally treated the soil outside of the foundation wall. This procedure should give additional protection where foundations are permeable.

Question 7—Is it necessary to treat soil outside of foundation wall, where part of the area under building is unexcavated, where foundation extends above soil surface and where no tunnels are observed on the outside of foundations walls?

Answer 7—In general, no, with the qualifications given in answer to question No. 6.

Question 8—Are soil poisons best applied by digging trenches or through perforated pipes forced into the soil?

Answer 8—My experience has been confined to the application of soil poisons in trenches. The 1, 2, 3, 3½ principles are broad enough to include any procedure proven effective in practice.

Question 9—What is a recommended treatment for infestations originating beneath filled-in porches?

Answer 9—This would vary with the type of construction and infestation. In the case of a small porch all of the earth would be removed through man holes; the concrete adjacent to the building could be broken through and mechanical or chemical insulation applied as a continuous barrier; or in the case of large porches tunnels could be cut adjacent to the walls giving at least 18 inches clearance between earth and floor of porch and soil poisons applied. Observation spaces are necessary. See page 37, Farmers' Bulletin 1911. If the soil about the perimeter be excavated, the central portion may have as low as 6 inches clearance, but periodic inspections are essential.

Question 10—Do you believe the flooding of the voids in hollow foundation units would be as effective as soil poisoning? (Describe a specific situation.)

Answer 10—Drilling and flooding are only adjuncts to principles 1 and 2. They are not as a rule necessary, unless there is poor mortar or hollow masonry units of walls, piers, chimneys, which make drilling imperative; exteriorly applied soil poisons would not penetrate.

Question 11—Have wood injections been proven a complete failure, or just a failure in the light that they were used as a cure-all or major objective in termite control? In other words, do wood injections have any supplemental value?

Answer 11—When used alone chemically impregnated timber even if treated in steel cylinders using vacuum and pressure will not constitute a "shield of treated wood." Termites are able to construct tubes over this wood which will only constitute a barrier in that they usually will not bore through it. Furthermore, we believe that treating timber already in place as commercially performed is not a satisfactory method nor is it necessary. There are many factors involved that affect absorption or permeability of wood, such as species of wood, sapwood and heartwood, moisture content, kind of preservative, amount of pressure, etc. (See Univ. of Minnesota Agric. Exper. Sta. Tech. Bull. 122.) Hence, there are several objections to recommending such a procedure: it will be used as a method of termite-proofing new construction; it has, in the past, and will again "freeze out" in unfair competition the small operator who may not be able to afford high pressure and expensive equipment. This method is not recommended by those state entomologists who have regulatory powers; however, steps 1, 2, and 3 of the standardized procedure for obtaining mechanical and chemical insulation are required by these same state entomologists. Termites are not only able to build shelter tubes over such treated wood but also, in some instances, bore through it. One chemical very effective when used in cloth bands for the control of the codling moth will not prevent termites from building earth-like shelter tubes over wood so treated. Entomologists cannot generalize in recommendations for insect control. Rotenone de-

rived from certain tropical trees will not protect cellulose products from attack by either termites or powder-post beetles; in fact certain bostrichid powder-post beetles breed in the wood from which rotenone is to be derived. Yet this chemical is very effective in controlling some truck crop insects.

Question 12—Do you think that termite shielding on new construction, even though we must admit that the majority of jobs have been shoddily or improperly placed, even at that, have justified the cost for the degree of protection that they have given?

Answer 12—Yes, but shielding is only a part or adjunct to effective termite-proof construction. As a rule shielding is not recommended for buildings already constructed except in cases of historic or permanent buildings such as Washington's home at Mt. Vernon, where even the chimney was reconstructed to include shielding, or other buildings of this type. Shielding can be installed on any type of construction if the cost is warranted and common sense is used. We all realize that there has been a racket in shield installations and much poor and unnecessary shielding installed. In some buildings shields were placed on foundations where there was a complete basement with concrete floor and walls. At other times the protection value of shields was rendered useless by poor construction details, or the shields were of poor design or incorrectly installed.

After 16 years service in southwestern Louisiana, where humidity is high, only 5 out of 1,487 twenty-six gage galvanized iron shields were rusted out. Painting the shields did not add to their length of life. In these installations the complete cost was approximately 25 cents per pier, or 15 to 20 cents per linear foot; cost per average house $40. In some cases the shields were installed after the erection of the building and stopped actual infestation. Periodic inspections must be maintained so as to prevent conditions which might contribute to the failure of the shields. Exceptionally heavy cobwebs in a few cases led to such failures.

Question 13—Do you think that we should go to the expense of excavating on the unexcavated parts of the house, until we have 18 inches of clearance, where on the outside the yard has been filled in to where the sills are only a few inches and sometimes even with the grade line?

Answer 13—Removing the earth would be practical, provided that the clearance on the outside be raised by excavating and installing concrete gutters or using soil poisons. Grade level and clearance are very important. It may be necessary to vary the type of soil poison to meet with local requirements.

Question 14—As the commercial operator is called to do a termite job, with the varied types of construction, and the varied working conditions, (that cannot always be met as we would like), don't you believe the termite operator should understand reconstruction and chemistry, as they apply to termite control, as well as a good knowledge of termites and their habits and life history; and that the operators should have many different processes or methods to work with, to meet these varied conditions, so he may give the owner the degree of protection that he is entitled to, for his money?

Answer 14—The operator is a structural pest control operator and should understand construction, chemistry and termite biology. Many operators are woefully weak with regard to all or some of this knowledge. However, there has been improvement. By adhering to the 1, 2, 3 and 3½ principles and adapting the procedure to the case under consideration he will have the correct fundamentals. By consulting with federal and state officials and cooperating universities even greater improvement in the future can be attained.

Sometimes problems of economics arise and it is necessary to make "cheap repairs for the cheap ones," to quote Kipling. However, it would be an absolutely wrong attitude to merely do sufficient work to "get by" in the hope that there will be no outward indications of termites at work until after the guarantee period has passed—except in the case of a special contract at the owner's risk.

Every effort should be made for as great a degree of permanence as practicable in order to build up a reputation and good will. This is particularly important since the better type of termite control operators desire to be considered under the classification of structural pest control, with engineering qualifications. An engineer would build a bridge for permanence, not merely to last until paid for.

By cut-price bidding, unethical and poor work state entomologists have been antagonized; they feel that while there are honest operators there is still a considerable racket. In consequence, they do not feel free to recommend members of your industry as freely as they should. Education, not legislation, is the remedy.

Question 15—Have you observed any tendency for the termites to have periods (years) of abundance and periods or years of scarcity?

Answer 15—Yes, recently in widely separated localities houses

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ranging from one to two hundred years old have been attacked—never before had they been infested. An examination of early colonial houses at Mt. Vernon, Arlington and Williamsburg, Va. showed that there had been several cycles where attack by termites, abandonment and reattack had occurred. Very little exact data have been collected. Dr. von Schrenk of St. Louis, Mo. has some confirmatory evidence. The old U. S. Mint at New Orleans, La. when reconstructed as a federal prison disclosed evidence of repeated or cyclic infestation. No real research work has been conducted on this interesting subject and probably factors of types of construction, and quality of materials as well as biological cycles may be involved.

Termites

Fundamentals of Subterranean Termite Control

NOTE:—The following fundamentals or principles of subterranean termite control were adopted by The National Pest Control Association in October, 1939. (There is in process of revision by the Termite Committee some of the phraseology which recommendations will undoubtedly be submitted for action at the Chicago meeting in October, 1944.

1.—**Structural modifications:** Direct contacts of untreated wood between wood members in the building and the soil must be broken by removal of the wood or placing it on concrete.

The premises must be cleaned up and all loose wood debris, and other cellulose-bearing material must be removed from underneath or near the building, including stumps, wooden forms, wall board debris, etc.

In all unexcavated areas, earth must be removed to within 18 inches of floor supports (joists, beams, sills) of the building, or parts thereof, such as porches, etc. In the case of earth-filled porches, etc., it may only be necessary to remove the earth in the vicinity of the foundations by tunneling so that the soil poisons may be applied under operation 2. Unless the concrete porch is reinforced, such tunnels should be temporarily braced with timbers to prevent collapse.

Cracks or grooves, or voids in mortar between masonry units should be pointed up, or, where practical, capped at the top with concrete; if this is not practical such areas should be drilled and chemicals forced into them under operation 3.

Mainly for the purpose of preventing or stopping rot, proper ventilation must be secured underneath buildings where there is no cellar or basement, namely, ventilating openings proportioned on the basis of 2 sq. ft. of net opening area for each 25 lineal ft. of exterior wall; the openings need not be placed in front of such buildings where they might be unsightly, but shall be arranged to prevent any "dead ends" or unventilated areas.

Where economically feasible in the case of frame buildings, there shall be installed a continuous course of non-corrodible metal, such as 16 oz. hard (C.T.) copper, zinc, or copper bearing galvanized iron of not less than 26 gauge on top of the masonry foundations. For interior foundations and interior faces of exterior foundations, this metal shield shall project at least 4 inches beyond the face of the walls and/or piers and 2 inches of this projection shall be bent downward at an angle of 45°. For exterior faces of exterior foundations, the shield may project only 2½ inches beyond the face of the walls and/or piers, of which 2 inches of the projection shall be bent downward at an angle of 45°. All seams in the metal course shall be of the lock-joint type. All corner seams shall be soldered. All vertical piping which enters the soil also shall be shielded in a similar manner. In general, metal termite shields are recommended for new constructions, since usually it is very difficult and costly to install them on buildings already constructed.

2.—**Soil Poisons:** It is realized that at times the structural methods herein recommended are not practical from an economic standpoint. Soil poisons placed about the foundations may be used as a substitute or as a supplement where reconstruction is not entirely practical. Effective toxic chemicals shall be applied in or on the soil around all walls or piers, chimneys, chimney sections, and the bases of heating units; also around all vertical piping which penetrates the soil, and at such other points where it appears likely that termites may obtain access to the building. The chemical should be toxic to termites, as permanent as possible, and should be one that when used with reasonable care will not be harmful to the human or animal life or contents of the building.

3.—**Drilling:** In cases where it is possible for termites to pass through voids and spaces in or between foundation walls, piers, chimneys, etc., constructed of masonry units, an effective chemical barrier shall be forced into such voids and/or spaces.

3½.—**Flooding:** In cases where the structural changes are impractical and foundation walls and/or piers are of especially poor construction, or in an unusually bad condition, an effective toxic chemical shall be injected between the top of the masonry and the wood member or members.

Registration of Pest Control Operators

By **BERNARD G. BERGER**, *Assistant Entomologist, Illinois State Natural History Survey, Urbana, Illinois.*

Editor's Note: Paper presented at the St. Louis War Emergency Meeting of the National Pest Control Association, October 27, 1943.

IN ILLINOIS and surrounding states there are three classes of pest control operators: One is a group desiring to give to the customer his money's worth and to have satisfied customers. Firms belonging to this group know many of the problems of insect control and understand the need for efficient termite control. The second group consists of those who desire to do satisfactory work and to have satisfied customers, but who are unable to do so because of insufficient knowledge concerning insect control. The third group consists of a few who believe the pest control business is a good racket, and attempt to do as little as possible for as much as they can get.

Because this minority group was known to exist, the Structural Pest Control Questionnaire was sent to all known pest control operators in Illinois and Indiana. The real purpose of this Structural Pest Control Questionnaire, which had special reference to termite control, was to find out how many companies do pest control work, their territory, and scope of work, and to make up a list of accredited companies which we can use. Here are a few figures taken from the questionnaires; 36 questionnaires had been returned from each state at the time this article was written:

	Illinois	Indiana
Companies offering complete service in pest control	33%	28%
General pest control (not considering mothproofing, fumigation, or termite control) (23% specializing in Illinois)	86%	58%
Mothproofing (5% specializing in Illinois) (6% specializing in Indiana)	58%	44%
Fumigation (5% specializing in Illinois)	56%	56%
Termite control (14% specializing in Illinois) (45% sepcializing in Indiana)	61%	81%
Selling products to the public	58%	42%

Of the 72 questionnaires returned, 42 contained information on termite control that could be used in determining to what extent the companies adhered to the 1-2-3-3½ principles of subterranean termite control as adopted by the National Pest Control Association. One represents structural modification; two, soil poisons; three, drilling voids and space in walls where termites might pass through and treating; three and one-half, flooding with a toxic chemical between the top of the masonry and the wood member of the structure.

Thirty-one per cent of the 42 companies follow the 1-2-3-3½ principles. Also, 31% practice 2 and 3½; fourteen per cent practice the 1-2-3 points; and 14 per cent follow the 1-2-3½ points, or no drilling. Seven per cent reconstruct and poison the soil for termite control, and two per cent treat only the wood. Now I realize that I have only the questionnaires on which to base my opinions, and that maybe in talking to many of these companies I would find more than a third following the National Pest Control Association 1-2-3-3½ principles of subterranean termite control.

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The chemicals used vary a great deal, and the following is a list of those mentioned in the returned questionnaires. One must realize that many companies use a number of different chemicals on the same job and therefore just because more companies use a certain chemical, it does not indicate that it is the best and should be used throughout on all jobs or that the chemicals in themselves constitute the answer to a complete subterranean termite control job.

Sodium arsenite is used by	11 companies
Pentachlorophenol is used by	10 companies
Trichlorobenzene is used by	9 companies
Antimite is used by	6 companies
Orthodichlorobenzene is used by	5 companies
Terminix is used by	3 companies
Extermital is used by	3 companies
Creosote is used by	2 companies
Cre-O-Tox "A" is used by	2 companies

Other chemicals mention are Velsicol No. 50, Termtox, Dowicide, zinc chloride, Termicide, paradichlorobenzene, carbolineum, Chec products, Permatox "A", and Premetox. One company admitted that it used organic and inorganic chemicals for termite control. We did not receive a reply to a follow-up letter to this company.

In Indiana, where the operators are better organized, the returns were almost 100%, while in Illinois, only about 25% were returned. Any operator in Indiana or Illinois who did not fill out a questionnaire should request a blank questionnaire and complete it for our files (Purdue University, Lafayette, Indiana, and Illinois State Natural History Survey, Urbana, Illinois).

The questionnaire was a cooperative project. I wrote to Mr. William O. Buettner, Secretary of the National Pest Control Association, about the termite firms which had swindled the taxpayers of Illinois, and he wrote back saying that John Q. Public should have more sense, but suggested an intensive radio program and literature to assist the public, together with an effort to have pest control firms register by means of the questionnaire. Professor John J. Davis and the late Professor W. P. Flint also thought Bill had a good idea in registering the pest control operators so that we would know who was in the business, their territory, methods of termite control, and a few other things about the company. With this information we could give John Q. Public the names of local companies and in that way help him to obtain the services of a pest control company which would live up to its claims and agreements entered into.

The following case histories are examples of fraudulent termite control activity that has occurred in Illinois which have come to my attention and which I know to be true: The house in the first case, located in a small Illinois town, was not worth very much, but the following payments were made by the owner, an elderly widow, for termite control:

1940	Sept.	$164.80	
	Sept.	30.00	
	Sept.	150.00	
	Nov.	15.00	
	Dec.	82.80	
	Dec.	160.00	
1941	April	621.55	(The company decided it was not an ordinary job and it needed a pressure treatment, necessitating the use of expensive equipment.)
	July	30.00	
	Nov.	341.12	(Name given to a second company which treated the house for inflammable gas, which was the termite treatment.)
1942	Sept.	300.00	(Powder post beetles)
	Total	$1,895.27	

I believe that a similar house in this town could have been purchased for two or three thousand dollars before

the war. I examined this house and could not find termites nor signs of termites. The woman who owned it said that termites were found on the floor and in the far corner of the basement by the so-called termite operators.

Inspection showed sound wood. Without a doubt the parties who made the inspection had termites in their pockets.

Powder post beetles were present in one small area. These insects could have been controlled by the use of chemicals costing at the most only a few dollars.

Another case, and again that of an elderly widow:

1939	Sept.	$ 30.00	
	Oct.	46.20	
	Oct.	8.20	
1940	Dec.	135.00	
1941	May	85.00	
	June	60.00	
	Aug.	381.00	(Pressure treatment)
		45.00	(Attic)
1942	Jan.	527.60	(Treated for inflammable gas)
	Feb.	464.80	(Retreated because treatment for inflammable gas removed termite treatment)
	Total	$1,782.80	

On inspection of this house, I found termites were still active and in such a place that, if the house had been treated at all, the termites would not then have been present. However, the termite infestation was minor and located in some boards lying close to the foundation.

With this kind of information, one who is employed by the public to educate, and to watch out for the public's interest, begins to wonder what he can do. It appears that the educational part is too great and difficult and that it will not reach all the people, and certain termite control companies will not voluntarily reform their methods of business. Therefore another way may be easier and more effective: that is, to investigate each company, and to unite the reliable local pest control operators, Better Business Bureau, the Farm Bureau or other agencies in an effort to send business to reliable companies in each town or area.

Here is a letter which is typical of the ones we receive quite often:

"Will you please send me literature regarding termites and their extermination?

"Also, do you have a list of accredited termite exterminators?

"Last week a man from Harrisburg, Illinois, named John Doe, solicited me to treat my home. He claimed he would treat it, and guarantee inspection each year for five years for $55.00.

"It struck me that if the treatment was any good that this was unusually cheap. I asked him what he used, and he said he used 'Termite.'

"Any information you might be able to give me would be appreciated."

We sent the writer of this letter the termite publication and a list of Illinois operators and told him that he was right in believing that the treatment would be of little value. To John Doe we sent the questionnaire, and to this day we have not received an answer from him.

Of course, our failure to receive the questionnaire should not ostracize any firm, because I believe that many operators for personal reasons do not desire to give this information freely. But in the above case we might surmise from the low cost quoted that the work would be of little value and that the operator probably did not understand termite control.

At the present time interest is being shown in several other states concerning a similar questionnaire to be sent to the pest control operators in those states.

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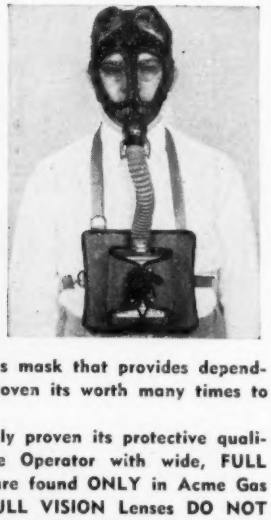

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Elusive Irritations

By GEORGE R. ELLIOTT

Notes on discussions, apropos "Entomophobia" (imaginary insect infestations), at the 1944 Regional Pest Control Operators' Conferences at Massachusetts State College and Purdue University, led by Dr. James O. Walls, Health Commissioner, Worcester, Mass., and George R. Elliott, president of the NPCA.—Ed.

PEST CONTROL OPERATORS, consulted in cases of insect infestations, naturally clear a majority of complaints of bodily irritations which are assumed to be due to insects. Although the symptoms may be much the same, it must be borne in mind that there are many possible causes, some real, some imaginary, of the irritations reported. Among recognized causes are:

(I) Irritations brought about by tangible insects or manifestations of disease
- A. Actual Insects
- B. Fungoides
- C. Arthritics
- D. Diabetics
- E. Drugs
- F. Allergy
- G. Skin Diseases
  1. Ichthyosis
  2. Hypo-thyroidism

(II) Irritations from imaginary (not real or tangible) causes
- A. Drugs
- B. Allergy
- C. Stimulation from having seen a repulsive sight of actual insects
- D. Suggestion

The immediate function of the PCO is to establish the presence and identity of actual insects, or their absence. There may be fleas, lice, mites, thrips, gnats, or others. Insects which do not actually bite may, by their mere presence, produce the same general reaction. Except for some of the mites, most insects likely to be involved are large enough to be seen with reasonable scrutiny. PCO's employ various devices, such as white cloth or sticky flypaper, to lure specimens. Eradication is a routine matter.

If no insect life is present, the problem becomes one for the physician or the psychiatrist. The PCO retains only the important responsibility of persuading the sufferer to enlist proper medical attention.

Not uncommonly the cases prove to be mental disturbances classified as hallucinations. They differ, however, from the type of hallucination most familiar to mental specialists, in that the latter are usually visual or auditory, whereas those we are concerned with are tactile, having to do with the sense of touch. A PCO and a medical entomologist, respectively, have suggested the terms "insectophobia" and "entomophobia", literally "fear of insects", as descriptive of the ailment. Women are the principal sufferers, to the extent of about 80%, in cases reported. Although the trouble is usually confined to one person, others of a family group have occasionally been affected.

Not to be confused with hallucinations are the rather common instances of mass irritation, such as among workers in stores, factories, and offices, where multiple "biting" is alleged, but no insects found. Such cases would be more accurately explained as mass hysteria, induced by suggestion or imitation. In such situations, relief has frequently been effected by resort to superficial disinfecting treatment or fumigation.

Where the problem is mental, the layman is not qualified to attempt treatment. The "insects" and their

damage remain most real to the sufferer. To argue otherwise is futile; and serves only to fix the hallucination. The victim will no more recognize the need of going to a mental specialist than you would, if he insisted that you go. Above all, the PCO should not ridicule, but should exercise sympathy, patience, and tact. A helpful word to remember in this connection is "explain". Stress that the doctor can "explain" the condition; there is seldom objection or resentment to the idea of having something "explained".

The patient may be in need of a complete neuro-psychiatric check-up and examination; there may be showing signs of brain tumor or other brain or eye disease. A number of the cases reported have eventually gone to mental institutions, where some have been cured. There is record of at least one suicide.

Inquiries conducted in connection with the Eastern and Purdue PCO Conferences, representing some 225 pest control operators, indicate (1) that practically every PCO has encountered cases of the type under discussion, (2) that such cases are apparently on the increase. Incidentally, these PCO groups described more personal knowledge cases than are to be found reported in entomological and medical literature combined.

Here is an intriguing field for useful research, an opportunity for teamwork in the part of the pest control operator, the medical entomologist, the dermatologist, and the psychiatrist.

Aerosol Bomb Kills Insect Pests

One of the developments of this war growing out of experimental work of the U. S. Department of Agriculture—the insecticidal aerosol—provides a new method of using old weapons in man's ceaseless battle against insects. "Aerosol" is the scientific term for smoke or fog. As is implied, the insecticide or killing material is carried in suspension in the air as a smoke or fog.

Even before the outbreak of war the Department of Agriculture's Bureau of Entomology and Plant Quarantine in experiments at Beltsville, Md., had made progress with this method of using insecticides. The practical application of the results of those preliminary experiments was developed, however, under the impetus of the war emergency.

The principle of the aerosol or liquefied-gas method of combating insects is very simple. The insecticide is dissolved in a low-boiling liquid, which exerts considerable pressure in the closed can containing it. The solution is then released through a small opening, the sudden change in pressure allowing it to boil violently and disperse the insecticide into the air.

In this "fog" the killing material stays active much longer than a spray, which settles completely in about 2 minutes. Efficiency of the insecticide is thus greatly increased.

The best of the known compounds for producing the fog is the common refrigerant known as Freon 12, chemically termed dichlorodifluoromethane. It is non-toxic to man and animals, non-flammable, and has other advantages—with few disadvantages. Pyrethrum extract is the toxic material most commonly used. Sesame oil is also included in the formula.

The aerosol can be used in barracks, tents, and fox holes. One pound of aerosol is more effective than 2 gallons of the old-type fly spray and therefore the shipping space for insecticide is greatly reduced. The new material is already in common use in fumigating airplanes to prevent the spread of disease-carrying insects. One large-scale experiment showed that mosquitoes and flies could be cleaned out of a factory containing 27 million cubic feet of space without interrupting the regular work. During the coming year the new method is expetced to be tested extensively in such large factories.

As now used the aerosol is put up in small cylinders, called bombs. These are, however, not now available for civilian uses. Diminishing supplies of pyrethrum and Freon have necessitated a search for substitutes. The Department of Agriculture's scientists have already found that for some uses Freon can be replaced in part by methyl chloride, propane, or butane.

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Entomophobia Case Histories

Submitted by ROBERT E. HACKLEY

PROFESSOR W. B. HERMS of the University of California has had a number of disturbed mental cases involving supposed insects brought to him. He speaks of such manifestations as "Entomophobia", literally, fear of insects.

When a case of entomophobia comes to an operator, he should remember that he is dealing with a sick person. Sickness is not funny and the operator should listen patiently and sympathetically. If it appears that a show of treatment will bring some satisfaction and the family consents to it, it may be a help to put on a show, using preferably somewhat elaborate equipment and a material with an odor suggestive of disinfectants. Obviously all such cases should be held in the strictest confidence. If there is a doctor in attendance, he should be consulted.

On the other hand, there are times when it is difficult to distinguish between a mental case and a real insect trouble, we should be careful to avoid confusing the case of the habitual kicker or the merely finacky person with the one who is a person with a definitely abnormal mental state dominating him.

Mental cases are good things for the operator to avoid.

Several case histories of entomophobia with which I have had personal contact follow:

Case 1. A woman in middle life complained to the Health Office of bugs infesting her home and being especially annoying near a garden gate. Upon visiting premises, with the health oficer, and interviewing the woman, I could find no insects that could be causing any substantial difficulty. The woman was very much in earnest about the annoyance she was suffering but very inaccurate in her description of the insect supposed to be causing the trouble. There was nothing that could be done to help the situation and I heard nothing more from the case for a long time. Some years later it was reported that the woman was being cared for in a mental case institution.

Case 2. A woman came to me and complained of being bitten by insects, showing a small red spot on her arm as one of the bites. The spot was about a sixteenth of an inch in diameter and was not raised as a pimple would be or as it would likely be if it resulted from a bite. Upon going to her house she pointed out various places from which the insects descended upon her and said they were prevalent all about the house. She had previously been to see various health authorities and showed me a pamphlet relating to the rat mite, some official having suggested that this might be the cause of her trouble. She found for me various specimens which she presented as samples of the insects. This was after I failed to see any of the insects which she was trying to point out to me. These specimens consisted of various kinds of material such as may be picked up behind furniture or in corners not thoroughly swept and dusted, no sample was an insect.

I advised her that there was practically nothing needing to be done and that in all probability the trouble

would disappear after a time. She returned and insisted that the house be fumigated. I warned of the expense and futility of the process and suggested she spray the worst spots with fly spray herself. Dropping in later to see how things were going, I found her busily spraying the outside cellar stairs where cobwebs, dirt, and various other things presented a semblance of an insect haven. I encouraged her to believe that if there were any insects present, they would be killed by the spraying. Since she was under the care of a doctor, I telephoned him saying I did not think she was really troubled by insects. He agreed with me. Later on she told me she had had the place fumigated.

The last time I saw her she was not suffering from insects. It is reported that she suffers from or gives evidences of having a mental difficulty. She is married and has children, but at the time was not living with her husband.

Case 3. In this case a woman about 70 years old suffered a stroke that impaired her speech severely. She was confined to the bed and was under the care of a physician, and had every attention that could be wished for, yet she complained of "big bugs" vigorously, gesticulating to show how they swarmed about her and where they were. The family asked me to do something to satisfy her. With the understanding of the family that I expected to kill no bugs and that the difficulty was purely a mental condition, I sprayed her room thoroughly with sheepdip diluted so as to leave plenty of odor without making stains.

When I came to her chair with removable covers tied upon the arms, she smiled with great satisfaction; I seemed to be hitting one of the important spots. When I took down the pictures from the walls and sprayed their backs. During this time I talked to her pleasantly about the members of the family and she seemed quite pleased. When about to leave she made energetic motions toward the door, so I asked, "Do some bugs come in by the door?" She nodded, "Yes," most emphatically, so I told her I would spray the outside of the door carefully when I went out. This pleased her. The family was satisfied and has since told me that there had been very little difficulty with the supposed insects following the treatment.

Notices of Judgment Under The Insecticide Act

1886. **Adulteration and misbranding of "Sodium Fluoride." U. S. v. Cole Laboratories, Inc. Plea of guilty. Fine $300.** (I. & F. No. 2269. I. D. Nos. 2388 and 2389.)

1887. **Adulteration and misbranding of "Powdered Trojan Derris Root," "Powdered Trojan Cube Root," and "Powdered Cube Root." U. S. v. S. B. Penick & Company. Plea of guilty. Fine $603.** (I. & F. No. 2325. I. D Nos. 4972, 6631, and 6652.)

1889. **Adulteration and misbranding of "Pyrethrum Extract 20." U. S. v. five cans of "Pyrethrum Extract 20." Default decree of condemnation, forfeiture, and destruction.** (I. & F. No. 2283, I. D. No. 5853.) **Associated Chemists, Inc., Chicago, Illinois.**

1891. **Adulteration and misbranding of "Hughes Sure-Kill." U. S. v. Henry J. Brownstein, trading as the Hysan Products Company. Plea of guilty. Fine $100.** (I. & F. No. 2279. I. D. Nos. 3398 and 3879.)

1892. **Adulteration and misbranding of "Fluorex V" and misbranding of "White Fluorex V." U. S. v. American Fluoride Corporation. Plea of guilty. Fine $50 each on counts one and two relative to "Fluorex V" and $100 on count three relative to "White Fluorex V."** (I. & F. No. 2300. I. D. Nos. 2455 and 2464.)

1893. **Misbranding of "Sterilan." U. S. v. American Fluoride Corporation. Plea of guilty. Fine $100.** (I. & F. No. 2306. I. D. No. 6483.)

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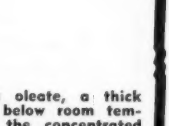

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Additional Patents Relating to Pest Control

By DR. R. C. ROARK.

2,338,380 (Jan. 4, 1944; appl. November 28, 1940. INSECTICIDAL COMPOSITION. William F. Hester, Drexel Hill, and W. E. Craig, Philadelphia, Pa.—Rohm & Haas Company, Philadelphia, Pa.—Examples of compounds covered by this patent are 2-(o-nitroanilino)ethanol,2-(2,4-dinitroanilino)ethanol and N-(2-hydroxyethyl)-o-nitroacetanilide.

2,338,390 (Jan. 4, 1944; appl. June 4, 1941). REINFORCED GARMENT BAG. Albert F. Ziegler, Cheviot, Ohio—Clopay Corporation, Cincinnati, Ohio.

2,339,050 (Jan. 11, 1944; appl. November 22, 1941). IMPROVING THE ODOR OF THIOCYANATE INSECTICIDES. William F. Carson, Jr., Brunswick, Ga.—Hercules Powder Company, Wilmington, Del.—The thiocyanate is washed with a 1 per cent aqueous solution of aniline.

2,339,379 (Jan. 18, 1944; appl. May 11, 1942). SPRAY GUN ADAPTER. Thalis E. Cook, San Angelo, Tex.

2,339,426 (Jan. 18, 1944; appl. Oct. 9, 1941). SPRAYER. Ralph R. Root, Lakewood, Ohio—Root Manufacturing Company, Cleveland, Ohio—A hand sprayer is described.

2,339,654 (Jan. 18, 1944; appl. Sept. 26, 1939). METHOD AND APPARATUS FOR DESTROYING INSECT LIFE. Franklin S. Smith, New Haven, Conn.—This apparatus destroys insects in flour.

2,339,732 (Jan. 18, 1944; appl. March 1, 1940). APPARATUS FOR DESTROYING INSECT LIFE. Franklin S. Smith, New Haven, Conn.

2,339,733 (Jan. 18, 1944; appl. July 16, 1940). METHOD AND APPARATUS FOR DESTROYING INSECT LIFE. Franklin S. Smith, New Haven, Conn.—This apparatus destroys insects in flour.

2,339,734 (Jan. 18, 1944; appl. Jan. 3, 1941). APPARATUS FOR STERILIZING FLOUR AND THE LIKE. Franklin S. Smith, Bethany, Conn.

2,339,735 (Jan. 18, 1944; appl. July 25, 1941). APPARATUS FOR THE TREATMENT OF FLOUR AND THE LIKE. Franklin S. Smith, Bethany, Conn.—This apparatus destroys insects in flour.

2,339,736 (Jan. 18, 1944; appl. April 8, 1943). APPARATUS FOR STERILIZING FLOUR AND LIKE PRODUCTS. Franklin S. Smith, New Haven, Conn.

2,339,737 (Jan. 18, 1944; appl. Jan. 14, 1942). INFESTATION DESTRUCTION. George E. Hulse, New Haven, Conn.—The Safety Car Heating and Lighting Company, Inc.—Insects in flour are destroyed by impact.

2,339,745 (Jan. 18, 1944; appl. April 10, 1939). VERMIN POISON DISPENSER. John McK Ballou, Los Angeles, Calif.—A. S. Boyle Company, Jersey City, N. J.

2,340,019 (Jan. 25, 1944; appl. July 26, 1941). INSECT SWATTER. Foister S. Rimer, Richmond, Mo.

2,340.255 (Jan. 25, 1944; appl. Jan. 27, 1942). ROACH RUN. Alex Well, New York, N. Y.

2,340,256 (Jan. 25, 1944; appl. April 17, 1942). ROACH RUN. Alex Well, New York, N. Y.

2,340,328 (Feb. 1, 1944; appl. Feb. 14, 1942). MOTHPROOFING COMPOSITION. Hilton Ira Jones, Wilmette, Ill.—Hizone Products, Wilmette, Ill.—A mothproofing composition contains a small amount of a magnesium benzene sulfonate and consists essentially of ethanolamine silicofluorides and magnesium silicofluoride in a ratio of about 1 to 1-3, respectively.

2,340,484 (Feb. 1, 1944; appl. April 25, 1941). TRAP. Eben Ferdinand Mogren, Weaver, Minn.

2,340,897 (Feb. 8, 1944; appl. June 19, 1939). INSECT TRAP. Harold T. Peirson, Brooklyn, N. Y.—Clothes moths are attracted to this trap by a lure of powdered defatted milk mixed with powdered arsenic.

2,340,944 (Feb. 8, 1944; appl. September 2, 1941). INSECT ELIMINATOR. Harry C. Easter, Kansas City, Mo.—Insects are sucked into a cutting and disintegrating device.

2,341,657 (Feb. 15, 1944; appl. June 28, 1939. In Germany June 28, 1938). PRODUCTION OF DISINFECTANTS AND PEST EXTERMINATING AGENTS. Karl Wilhelm Rosenmund, Kiel, Germany.—The patentee claims disinfectants and pest exterminating agents, consisting of a water solution of phenols, some of said phenols being bisphenol phosphates serving as solubilizing agent for the others, at least one of the phenols being a halogen-substituted and alkyl-substituted aromatic hydroxyl compound.

2,342,406 (Feb. 22, 1944; appl. November 16, 1942). FUMIGANT BAG. Randall Latta and Alfred H. Yeomans, Washington, D. C.—Claude R. Wickard, Secretary of Agriculture of the United States of America, and his successors in office.

2,342,444 (Feb. 22, 1944; appl. January 30, 1943). MOUSE

TRAP. Harvey M. Alday, Springfield, Mo.

2,342,448 (Feb. 22, 1944; appl. February 18, 1942). PEST CONTROL. Euclid W. Bousquet, Wilmington, Del.—E. I. du Pont de Nemours & Company, Wilmington, Del.—A saturated solution of di-isobutylene dithiocyanate in refined kerosene tested according to the standard Peet-Grady method for testing fly sprays gave a knock-down at the end of ten minutes of 95% and a kill at the end of 24 hours of 71%. Under the same conditions of evaluation the official NAIDM test insecticide gave 99% down and 68% kill. The compound in question is 2,3-dithiocyano-2,4,4-trimethylpentane.

2,342,940 (Feb. 29, 1944; appl. June 11, 1942). SPRAYER. Sigmund Janke, Luscar, Alberta, Canada.

Bugs in the Blue

The idea of a group of bug catchers putting specially designed traps on airplanes and climbing as high as 13,000 feet to trap spiders sounds like the pipe dream of a befuddled butterfly chaser; nevertheless, there have been men engaged in just this activity for the Department of Agriculture, in one of the queerest test programs in history.

They have trapped thousands of insects of all sorts at surprising altitudes, and their systematic flights over Louisiana and Mexico in all seasons have proved that many insect destroyers of crops and carriers of disease are transported hundreds of miles over the air currents.

It looks as if the insects knew how to use winds and air currents to advantage long before man ever suspected their possibilities. The pink bollworm moth, a notorious cotton destroyer, was collected as high as 3000 feet above sea level and the flying entomologists determined that it can spread, by air, to this country from Mexico. The destructive grasshopper is an accomplished rider of the air currents, and on fair days, with a favorable wind, has been known to fly as much as 300 miles. It is so dependent on the wind, however, that complete destruction of crops and vegetation from grasshopper plagues has been averted by sudden wind changes.

Aerial commuters found as high as 5000 feet were malaria mosquitoes, blood-sucking sand flies, and a black fly harmful to men and fatal to some livestock; and horse-flies which transmit the deadly anthrax flew into the trap at 1000.

The traps are controlled from the plane's cockpit, or cabin, and the trap section is kept open for ten minutes of level flying at altitudes starting at a few hundred feet and working up to more than 16,000. A study of the mixed catch of insects taken at each level indicates whether a bug makes most of its advance under its own power or by soaring high and coasting along on the air currents. A bug's size and weight, and therefore its buoyancy, determine the height to which it can be carried, but once it is riding the currents, very little muscular energy is necessary to sustain its rate of speed.

This explains why so many wingless insects, such as ants, spiders, wood termites and even caterpillars, have been found on the aerial express. In fact, the specimen caught at the highest altitude of all—15,000 feet—was a spider. It is the spider's silky web which enables it to float so far aloft; if the dew point changes and the web collects moisture, the excess weight will bring web and rider down to a lower level.

Another odd discovery was that certain delicate, soft-bodied bugs seem to survive the rigorous conditions of cold and pressure several miles up better than their supposedly hardier relatives. The upper air has its hitchhiker element, too—little bugs riding along on the bigger ones' backs. And it has its Contrary Mary—a butterfly, the **Catophaga galena**, which flies directly into the wind. The scientists don't know just how it's done, although they believe it may be on the same principle as a man-made sailboat; but they do know that the harder the wind blows, the faster this perverse creature travels.—James Nevin Miller.

—*Saturday Evening Post.*

Answers to True and False Questions

51. True	63. False
52. True	64. False
53. False	65. False
54. False	66. True
55. True	67. True
56. True	68. True
57. False	69. True
58. True	70. True
59. False	71. False
60. True	72. False
61. False	73. True
62. True	74. False
	75. False

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WHAT'S NEW IN PEST CONTROL-PERSONALS

DAVE WEISBURGER, B. & D. A. Weisburger (pest control insurance specialists), N. Y., recently returned from a trip through New England, where he attended the April meetings of the New England and Connecticut Pest Control Associations. Dave reports that a number of the operators have greatly expanded their service operations and that insurance placements are on the increase. He further reports that his brother LeRoy, formerly associated with the firm, has been on a 3-month leave after completing a 2-year hitch in the Navy as a radio operator. Currently stationed at Armed Guard Center, Brooklyn, N. Y., LeRoy has had the exciting though unenviable experience of having had several ships shot from under him while on duty abroad. However, he's come through shipshape and is on deck awaiting further orders.

THE AMERICAN OFFICERS stationed in India were puzzled at first by the natives' refusal to kill any living thing, reports Leonard Lyons of the N. P. Post. The officers' puzzlement turned to anger at their servants' refusal to kill the insects which infected their quarters . . . One officer finally found a solution. He distributed some flit guns. The servants were reluctant to squirt them at the living insects. "Oh, but this doesn't kill them," the natives were assured. "This just puts them to sleep for a while, and gives them the rest they deserve." And that's why flit guns now are being used by the native servants—to give "sleep" to the insects of India.

INTERNATIONAL PCO TENNIS MATCH IN PROSPECT: From somewhere in Australia, Bill Delaplane, currently attached to a Navy Malariology unit, writes that he had a most enjoyable visit with Bernard Houghton, owner of Houghton-Byrne, largest pest control firm in Australia; and that on his next furlough he expects to play some tennis with Mr. Houghton.

"Since we left the States", adds Bill, "we became fouled up in transit. (Janfu, as we term it, meaning Joint Army-Navy foul up. Sometimes while trying to get our transportation difficulties aright we would emit such words as fubar, meaning fouled up beyond all recognition.) It turned out to be a lucky break for me for one of the places they fouled us up was right where Mac (McCauley) was. We had a whole evening together, and it was a pleasure beyond verbal description to see him. He's tanned and in the pink. I believe that German goitie is actually reduced. At the moment he is concerned indirectly with the control of scrub typhus (not to be confused with the louse-borne typhus), or tautsugamushi, also called Japanese river fever." Bill Delaplane, whose service address is Malariology Unit No. 73, Navy 717, Fleet Post Office, San Francisco, Calif., was formerly associated with the Illinois Pest Control Co.

THE STORY IS BEING TOLD of a lady who came to the apartment of a young man and found him sitting at a chess board. On the other side of the board sat his dog. "What are you doing?" the lady asked . . . "Oh, playing chess with my dog," he answered . . . "Can he play chess?" asked the lady . . . "Sure. His former owner taught him how to play. Watch." She watcher while the young man and his dog pondered and moved the chess men . . . "That's amazing," said the lady, "amazing. I can hardly believe my eyes. That's the smartest dog I've ever seen" . . . "What's so smart about him?" replied the young man. "I've beaten him 4 out of 5 games."

—From The Lyons Den.

INFANTILE PARALYSIS—Vague indications that mosquitos spread infantile paralysis came from J. Lytell Clarke, sanitary engineer of the Des Plaines Valley, Ill., Mosquito Abatement District, at the meeting of the New Jersey Mosquito Extermination Association. Clarke and his associates trapped mosquitos in the backyards of the afflicted Chicago area during the August-September epidemic of 1943, the worst the city ever suffered. Although 5,000 mosquitos were caught, efforts to see whether the mosquitos could give the disease to monkeys were apparently unsuccessful. Instead of the mosquitos biting the monkeys, the monkeys caught and ate the mosquitos. Mr. Clarke hopes to overcome this difficulty and prove his case next season.

—N. Y. Times.

U. S. GIVES NICARAGUA $300,000—Managua, Nicaragua.—A contract was signed yesterday between Maj. Gen. George C. Dunham, executive vice president for the coordinator of inter-American affairs, and Col. Luis M. De Bayle, Director General of Public Health in Nicaragua, whereby Nicaragua will receive $300,000 for sanitary purposes. The Nicaraguan Government will contribute $100,000.

PARRAN REAPPOINTED—Dr. Thomas Parran has been reappointed as surgeon-general of the United States Public Health Service.

COOPERATIVE INSECTICIDE ADVERTISING CAMPAIGN—The National Association of Insecticide and Disinfectant Manufacturers has authorized a schedule of cooperative advertising in a selected group of trade publications, to encourage wider use of better insecticides, disinfectants, floor waxes, cleaners, etc.

EXPERTS WILL APPROVE SPECIFICATIONS FOR INSECTICIDES—The British Ministry of Agriculture has prepared an approval scheme for insecticides, reports Chem. & Eng. News. The Ministry's experts will prepare a list of approved proprietary products for the control of plant pests and diseases, and these products will be suitably marked on their containers, so that consumers have a guarantee of a certain mini-

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mum standard of the insecticides they buy. It is not intended, at least for the time being, to make this scheme compulsory. British manufacturers and importers of insecticides may apply for official approval which will be given if the product in question either conforms to official specifications or contains active ingredients which are approved by the authorities, mainly on the product's biological performance. Secret products are not eligible for approval under the scheme. The administration of the scheme is in the hands of an advisory committee of specialists and a joint panel consisting of these appointed experts and representatives of the Association of British Insecticide Manufacturers.

FROM THE NEWSPAPERS of Europe the United Nations Information Office has culled a number of odd and curious items about books today—their rarity, the black market in them, the dangers that the nervous conquerors see in them. For instance:

(1) "The Pied Piper" has been banned by the Nazis because it has in it the pregnant suggestion that a German town can be overrun by rats.

(2) A fable by Andersen, "Little Green Soldier," has been removed from bookshop shelves in Europe. This story tells of a green louse that destroyed rose leaves and, unable to understand that it was destructive, wondered why no one loved it. This tale was considered "suggestive."

ABSTRACTS OF CHEMICAL PATENTS
Vested in the Alien Property Custodian

7,000 foreign-owned United States chemical patents which have been seized by the Alien Property Custodian are now being licensed to American manufacturers.

Abstract sections (listed below) are now in the process of being printed and orders for the material should be sent to the Office of Alien Property Custodian, Chicago 3, Ill. The price is a dollar per section or twenty-five dollars for the complete set of 33 sections.

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General Chemistry

1. Unit processes
2. Electrochemistry
3. Catalysis
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Inorganic Chemistry

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8. Fine chemicals
9. Mineralogy
10. Metals and alloys
11. Ceramics materials
12. Miscellaneous inorganic products

Organic Chemistry

13. Organic reactions
14. Organic synthetics
15. Derivatives of natural products
16. Photography
17. Pharmaceuticals and cosmetics
18. Foods
19. Fermentation
20. Fats, oils, soaps, waxes
21. Petroleum refining and products
22. Fuels
23. Plastics, synthetic resins, plasticizers, solvents.
24. Elastomers
25. Textiles, natural and synthetic fibers
26. Dyes, dyeing processes and textile chemicals
27. Wood, paper and pulp
28. Explosives and chemical munitions
29. Leather, tanning, glue
30. Protective and decorative coatings
31. Miscellaneous organic

Other

32. General supplement (newly vested patents)
33. Master index to all abstracts

CAPT. ROBT. R. HEATON, 0-476321, 15th Med. Gen. Lab., A.P.O. 570, c/o P.M., New York, is still in Italy and has been working with lice and mosquitoes, as well as DDT. This material has been used extensively in Italy for louse control and as a result has saved many thousands of lives from typhus.

LT. C. O. PARTLOW, G.A.A.F., 435th Sq., Greenville, Miss. Charley has at last gotten out of Texas and he feels those who have been assigned to Texas for so long as he has should receive credit for foreign service. Charley is assistant engineering officer and test pilot.

LT. CHARLES DENNY, 0-516061, Station Hospital, Camp Wolters, Texas. Charlie has been attending a Malaria School in Panama and is now based as above. He is interested in typhus control as well as mosquitoes and at present is training men for pest control service.

Mosquitoes are smart creatures in the Southwest Pacific. One soldier reports that he found them walking over the chests of his comrades, turning over the dog tags to find out the blood type.

ST. PATRICK'S DAY FATHER

Harry Studier, member of the Post Engineers, A.A.F., stationed at Brooks Field, Texas, became the father of a 6 lb. 14 oz. baby boy on March 17. Bursting with justifiable pride, Harry, whose home is in San Antonio, writes: "Got leave two weeks ago and went home to see my good wife and new baby. Boy, I hate to brag, but it is a job well done. Blond with blue eyes and can he yell." Mrs. Studier, we understand, is feeling in the "pink," while young "Paddy" is pink all over, and Harry—just plain tickled "pink." For that matter so are we as we send our heartiest congratulations to pop and mom on the advent of junior.

NEW PROCESS GIVES WOOD A STEEL-LIKE HARDNESS

A chemical process for transmuting ordinary wood into a material harder than ebony and strong enough in some instances to substitute for steel was announced recently by E. I. du Pone de Nemours & Co.

Under the process developed by the company along lines begun by the Forest Products Laboratory of the United States Department of Agriculture, the chemical, methylolurea, is impregnated into the structure of the wood in a water solution. The chemical reacts with components of wood to form hard, water-in-soluble, unmeltable resins within the wood. Heat speeds the conversion.

The announcement said that soft woods such as maple, tupelo gum, yellow poplar, pines and other quick-growing woods can be made as hard as the best hard woods, while the latter can be made into a substance harder than ebony, which nature requires a century to produce.

—*N. Y. Herald Tribune.*

COMPLAINT

One of the maids at the Savoy-Plaza, New York, listened to a Mr. Melton's report that he had seen a light-colored mouse in his suite. "I wonder if Mr. Melton takes a drink," she told the occupants of the suite next door. "He says he's seen a mouse. Nobody's ever seen a mouse in the Savoy-Plaza in 12 years" . . . Mr. Melton's neighbors assured the maid that such a thing was impossible, and then they checked out —without ever revealing that their son, the 11-year-old nephew of film star Van Heflin, had brought two white mice into the hotel, and that one of the mice escaped for three days and finally returned to the Heflin suite.

Lady (in restaurant): "Why don't you shoo your flies?"

Waiter: "Wal, it's so hot today I thought I'd just let 'em run around barefoot."

CURTAIN FOR CANINE STAR

Bob Williams, entrepreneur of one of vaudeville's best known dog acts, for which he was receiving $1,250 a week, has been forced to retire, "Variety" reports. Last Saturday, while Mr. Williams and his act were in Chicago, his star dog, Red Dust, ate some rat poison and died. Mr. Williams had never trained an understudy.

THE "HARDEST SINGLE THING" facing Navy doctors today is filariasis, a mosquito-borne disease which sometimes develops into elephantiasis, particularly of the scrotum. Already returned to the U. S. are 3,000 South Seas filariasis cases.

(Continued on Page 34)

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A practical and economical way to rid buildings of rodent pests! No hazards of poisoned bait . . . or of decomposition! Easy to prepare! Just place WIZO Rat Boards near rat hole or form a runway next to walls. Fasten boards to floor to prevent pulling away. Rodents are caught firmly the moment they step on the boards.

WIZO RAT GLUE can be obtained in quantities for preparing your own boards. Write for complete particulars.

ELKAY PRODUCTS CO.
323-27 West 16th St. New York, N. Y.

LOCAL ORGANIZATION NEWS

Connecticut Pest Control Association

The Connecticut Pest Control Association held its annual dinner meeting at The City Club of Hartford on April 10th, entertaining a number of distinguished guests, including Health Officials from various cities throughout the state. The New England Pest Control Association was also well represented.

After an excellent dinner, the meeting got off to a smooth start. President Oscar N. Anderson welcomed the guests and then introduced "Pete" Bohman who served as toastmaster in his usual inimitable manner. Mr. Bohman introduced the guests who spoke briefly in acknowledgment.

Mr. Leroy W. Van Kleeck, Senior Sanitary Engineer of the State Department of Health, described the work that his department is doing for the improvement of sanitation throughout the state.

Mr. George Elliott, president of the National Pest Control Association, gave a short talk on general matters of interest, including "D.D.T."

Principal speaker of the evening was "Bill" Buettner, secretary of the National Pest Control Association, who chose as his subject "The Importance of Pest Control to the Public Health and Its Essentiality in the War Effort." Mr. Buettner presented a very clear, detailed picture of the important role the industry plays in the preservation of public health, and the many difficulties under which it carries on this work, because of the numerous government restrictions which have necessarily been imposed for the reasons now familiar to all of us.

Present at the dinner meeting were:

George Elliott, President, National Pest Control Association, Worcester, Mass.
Wm. O. Buettner, Secretary, National Pest Control Association, Brooklyn, N. Y.
Leroy W. Van Kleeck, Senior Sanitary Engineer, State of Connecticut Department of Health, Hartford, Conn.
Dr. Roger B. Friend, State Entomologist, Conn. Agric. Experiment Station, New Haven, Conn.
Hamilton Storrs, Birchard System, Inc., Hartford, Con.
S. Langton, Birchard System, Inc., Hartford, Con.
David A. Weisburger, B. & D. A. Weisburger, New York, N. Y.
Dr. George H. Chapman, American Cyanamid & Chemical Corp., New York, N. Y.
George B. Lay, District Agent, U. S. Dept. of the Interior, Fish & Wildlife Service, Boston, Mass.
Francis B. Schuler, U. S. Dept. of the Interior, Fish & Wildlife Service, Storrs, Conn.
Franklin Fiske, Director, Bureau of Food & Sanitation, Board of Health, Hartford, Conn.
Mark Weintraub, President, New England Pest Control Assn., Boston, Mass.
B. W. Eldredge, Waltham Chemical Co., Waltham, Mass.
Roland Cook, Ransford Insecticide Co., Worcester, Mass.
Charles W. Houghton, Safety Fumigant Co., Boston, Mass.
C. Arthur Lantz, West Hartford, Conn.
O. N. Anderson, Berg Exterminating Co., Hartford, Conn.
Fred Haas, Aetna Exterminating Co., Hartford, Conn.
John Duncan, Birchard System, Inc., New Haven, Conn.
F. E. Bohman, Birchard System, Inc., Hartford, Conn.
Neely Turner, Entomologist, Conn. Agric. Experiment Station, New Haven, Conn.
Thomas J. Ledwith, Berg Exterminating Co., Hartford, Conn.
David Mason, Mason Exterminating Co., West Haven, Conn.
Joseph Putinski, City Storage Co., New Britain, Conn.
Joseph Roog, Atlantic Exterminating Co., Hartford, Conn.
L. A. Bureau, A.B.C. Exterminating Co., New Haven, Conn.

Report submitted by L. A. Bureau, Sec'y-Treas., CPCA.

Washington, D. C. Pest Control Operators

Since 1935 there appeared no necessity to hold meetings of the pest control operators in Washington, D. C. In recent months, however, owing to congested population and housing conditions, as well as manpower shortage, insect and rat infestations have increased. Especially have vermin problems become serious in the eating establishments and restaurants, of which there are 2,300.

The health Department has increased its staff of Sanitary Inspectors in an effort to have unsanitary conditions cleaned up and effective measures taken to exterminate roaches and rats. The American Restaurant Association is cooperating with the health officials by conducting an educational campaign and assisting pest control firms in cases where cooperation is lacking on the part of the restaurant proprietors.

The importance of an intelligent approach to these problems and more particularly standards that should prevail among pest control operators prompted reorganization of the pest control operators. P. Calvert Cissel was requested by the PCO's to call such meeting, which was held at 2003 I Street, Northwest, on Tuesday, April 4th.

William O. Buettner, Secretary of the National Pest Control Association, conducted an open forum which culminated in the adoption of the following standard approach and action in connection with rat work:

1. **Survey:** Inspects carefully the premises which are rat infested and records on a survey card the conditions.

2. **Three Factors of Extermination and Control:**

a—Killing—by means of baiting, gassing, trapping, and miscellaneous means (glue boards, repellents, shooting, etc.).

b—Sanitation—insists that cooperation be given to keep the premises clean; removal of debris and harborages; setting up measures that make water and food inaccessible.

c—Rat proofing—sometimes this is comparatively simple; other times, more drastic measures must be taken; other times for economic reasons. there are handicaps in doing what is desired.

3. **Reinspection and Maintenance Services:** Periodic visits that will set up preventive measures to avoid recurrences of infestation.

P. Calvert Cissel, William Walton, and Robert Byrne comprise a committee which will represent the PCO's on a joint committee with the American Restaurant Association to put into action the Rat Control procedures.

No formal election of officers of the reorganized Washington PCO Association took place but informally this group will meet as occasion demands. At each meeting there will be appointed two persons who will be in charge of a succeeding meeting. The next meeting will have as Chairman William Walton and Secretary is J. A. Macaboy.

Those present were:

William O. Buettner, Secy., National Pest Control Association.
William B. Walton, Western Exterminating Co., Inc.
Johnson E. Gaskins, Western Exterminating Co., Inc.
Napoleon D. Silver, Silver Brothers.
William S. Church, No Wonder Rat Exterminating Co.
J. S. Crook, Capitol Chemical Co.
Samuel C. Silver, Silver Brothers.
Nathaniel Madden, Arlington Exterminators.
J. R. Byrne, Apex Exterminating Co.
Lawrence Shaw, Exterminating & Chem. Service (Mt. Ranier).
W. H. Grahn, Theodore Meyer Est.
J. R. Fain, Owl Disinfectant Co.
J. S. Macaboy, Exterminating & Control Service.
Mrs. Wilson, Exterminating & Control Service.
P. Calvert Cissel, American Disinfectant Company.
Vernon E. Thomas, American Disinfectant Company.
J. Johnson, American Disinfectant Co.

"Branch Manager wanted. Real opportunity in either New York City or Connecticut for competent PCO by reliable, well-established firm. $4000 per year income assured. Sales personality desirable. Write full qualifications. Box 389—Pests."

New York Pest Control Association

A regular business meeting of the New York Pest Control Association was held at the headquarters, 366 Madison Avenue, New York City, on Monday, April 3rd. Routine business was transacted and a general discussion of war emergency problems followed. President William O. Buettner presided.

The report of the Secretary-Treasurer, W. J. Parker, showed a cash balance of $3,819.00 in the bank and $4,000.00 in War Bonds.

Looking to post-war activities, it was voted to continue with the present rate of dues, which ranges from $36.00 to $180.00 annually depending upon the number of employees. Justin Simon, Chairman of the Financial Committee, is to study a plan and make a report at the next business meeting whereby the work-load of President Buettner will be made lighter. Election of officers will also be held at the next meeting to be held the early part of May. The Nominating Committee is composed of E. N. Goldey, Chairman, Ray Kelly and E. R. Jennings.

Among those present were:

Theo. Schmerl, Disinfecting & Exterminating Corp.
M. A. Gladstone, Abbot-Madison Corp.
M. E. Blinder, representing Josephson Disinfectant Co., Inc., and Oriental Exterminating Corp.
C. Hasselriis, Jr., Ratin Laboratories.
S. Rohdie, Excelsior Exterminating Co.
E. R. Jennings, Guarantee Exterminating Company.
Justin Simon, General Exterminating Corp.
Morris Feldman, Columbia Exterminating Co.
A. L. Brody, Pioneer Exterminating Co.

Arthur W. O'Connor, Security Exterminating Corp.
A. R. Rubin, Sameth Exterminating Co.
W. J. Shrimplin, Rose Exterminating Co.
I. H. Drucker, Banex Exterminating Co.
H. Myers, Fumex Sanitation Co.
Sidney Wimmer, Majestic Chemical & Ext. Co.
Philip Mayer, Evins Exterminating Co.
Georgia E. Bloch, Brooklyn Exterminating Corp.
Philip Haller, Jr., Virus Limited, Inc.
William Farrell, Effective Exterminating Company.
Daniel J. Klein, Allied Exterminating Co.
Wm. O. Buettner, Buettner Pest Control Company.
Mrs. Alice Billings, Steamship Sanitation Company.
S. S. Rosen, Guaranteed Sanitation, Inc.
T. H. Mahon, Asst. Secy., National Pest Control Assn., Inc.

Herb. Meyer Addresses New England Pest Control Association

Guest speaker at the well-attended War Emergency Meeting of the NEPCA, held at the Hotel Lenox, Boston, April 18, was Herb. Meyer, regional vice-president of the National Pest Control Association. His talk, "The Pest Control Operator and His Associates" and on the latest developments in Washington with respect to manpower and vital materials, created much interest. Question period followed.

In addition a report of the NEPCA's War Emergency Committee on deferments of men engaged as pest control operators was read and discussed, as was a report on the April War Emergency Meeting of the Conn. Pest Control Association.

WPB Releases Truck for Sale to Kalamazoo Pest Control Firm

A 1½-ton Chevrolet truck (1944 model) just released by the WPB for sale to the A-B Exterminating Service of Kalamazoo, Mich. is additional evidence, if any is needed, of the essential nature of pest control.

Affiliated with the NPCA this firm consists of Albert G., Eugene R. and Alvin G. Bushouse, the last-mentioned having recently received an Honorable Discharge from the Armed Services. Justifiably proud of this latest addition to its truck fleet, the firm has three units in operation traveling nearly all of Michigan, servicing Army-Navy establishments, defense and food plants, as well as numerous retail stores and homes.

Business Opportunities
(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 512 E. 14th St., Kansas City 6, Mo., giving box number as well.

WRITE FOR THESE BOOKLETS

The latest helpful information service literature will be sent to you without cost or obligation. If, in addition, there are any particular pieces of literature offered by advertisers in this issue you are interested in receiving, either write them direct, or if you prefer, please send us such requests.

Please note, however, that you must request each booklet on a separate letterhead though they may all be mailed in one envelope addressed to Pests, 126 Lexington Avenue, New York City, N. Y.

SPECIAL ROACH POWDER

Circular describes a roach powder (containing Lethane A 70) which, it is stated, is fast acting, positive in kill and will not deteriorate for at least eight weeks after application. As a result, the supplier points out, the PCO does not have to service his customers as often, thereby conserving manpower. Moreover, it is stated, the powder is non-toxic to warm blooded animals and may, therefore, be used in dairies, packing and food handling plants, homes, etc., in fact, in all places where sodium fluoride mixtures may not be used. . . . Described also is a sodium fluoride-Pyrane formulation for the PCO who wishes to make his own roach powder.

WRITE PESTS—Bosley.

SODIUM SILICO FLUORIDE

Bulletin describes sodium silico fluoride product with proper density. Effective manner of testing for presence of HCN after ventilation also discussed.

WRITE PESTS—AC 70.

MILITARY FUMIGATION MANUAL

This special 48 page manual has been prepared for the benefit of officers and civilians in the Armed Forces who are responsible for vermin control, and for PCOs who may contract with the Armed Forces for fumigating work. Among other subjects, the manual discusses: dosage, preparation of building for fumigation, fumigation operation, common pests, cockroach control; precautions, first aid methods, etc.

WRITE PESTS—AC.

TERMITE CONTROL

Folder discusses concentrates available for two distinct methods of termite control: (1) treatment of timbers in place with an oil solution, and (2) treatment of all soil around an infested building or area with either an oil or water soluble chemical. Issuing company states it specializes in all problems concerning wood-destroying organisms and also wood preservation and invites your inquiries thereto.

WRITE PESTS—WOOD.

FUMIGATION SAFETY SUGGESTIONS

Of timely interest, in view of the at-hand fumigation season, is this bulletin which advocates as a safety measure the use of methyl orange-mercuric chloride test papers for the presence of HCN. It also discusses can openers for Zyklon Discoids, the need for adequate ventilation after fumigations, and gives a cautionary note on pilot lights in premises to be fumigated.

WRITE PESTS—AMERICAN.

STERILIZING GAS MASKS

News bulletin describes a chemical that is claimed by the manufacturer to be effective in sterilization of gas masks. Bulletin also discusses antidotes and first aid, particularly an inhalant which functions best as an antidote to HCN poisoning, and where obtainable.

WRITE PESTS—A-C-73

FUMIGATION AND PLASTICS

News release discusses use-co-ordination of such diverse chemical products as plastics and fumigants in connection with infested bagged grain, seed, packaged or boxed foodstuffs. Methyl bromide-plastic-tarpaulin method of disinfestation described.

WRITE PESTS—DOW

HOUSEHOLD SPRAY FACTS

Manufacturer's bulletin discusses Lethane's killing power, range of insect control, cost, chemical stability, spray formulas, etc.

WRITE PESTS—ROHM & HAAS.

PYRETHRUM - DERRIS - RED SQUILL PRODUCTS

Leaflet describes foregoing insecticides with special bait chart for use in connection with powdered red squill.

WRITE PESTS—PRENTISS.

SOLVAY PRODUCTS

48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

FREE COPY MAY BE HAD BY PEST CONTROL OPERATORS. WRITE SOLVAY, c/o PESTS.

DEODORANT

Catalog includes price data, etc., on deodorant which it is felt can neutralize and deodorize such toxic agents as Thanite, Lethane 384 Special, Velsicol, etc. Also contains data on perfume oils for sprays made with pyrethrum and kerosene.

WRITE PESTS—MAGNUS.

FUMIGATION NOTES:

Discusses spread of Discoids; reinfestation; effects on vegetables and eggs.

WRITE PESTS, AC58.

ELECTRIC FANS

Bulletin discusses value of electric fans in connection with fumigation work, also some pertinent thoughts on the Schafer Prone Pressure Method of Resuscitation, etc.

WRITE PESTS—AC-69.

MOLE KILLER PELLETS

Circular describes mole killer pellets which manufacturer states requires no traps, no gas, no exposed poison. Diagram of runways and explains how mole lives. Testimonial letters.

WRITE PESTS—CARAJON.

PRESERVATION OF MILLWORK AND OTHER DRY WOOD PRODUCTS

Bulletin discusses composition of Permatox B Concentrate and its application in the preservation of millwork and other dry wood products.

WRITE PESTS—Permatox 43-B.

(Continued on Page 34)

INSECT COLLECTIONS

Booklets describes pocket display case which may slip easily into a coat pocket making it of value for salesmen or others who travel about. Life history collections of structural type pests are also available for the PCO.

WRITE PESTS—Ward's.

SAFETY IN FUMIGATION WORK

Fumigation Safety Rule No. 1, namely "Vacate entire building even though only part is fumigated, as well as adjoining buildings into which gas may penetrate" is discussed in this bulletin.

WRITE PESTS—AC No. 78.

PIGEON-PROOFING

Folder describes pigeon-proofing invention which manufacturer claims will completely and decisively eliminate the pigeon nuisance. In use by real estate companies, churches, government buildings, etc.

WRITE PESTS—STANLEY.

CONTROL OF TERMITES-POWDER-POST (LYCTUS) BEETLES-DECAY

Circular discusses properties and uses of Permatox A in termite control and its application to soil and wood to control termites, decay control, powder-post beetle prevention and control. Description of Permatox T and its uses in termite control, as a soil poison, are also discussed, together with toxicity.

WRITE PESTS—BULLETIN 43-T.

BOX CAR FUMIGATION

Folder describes box car fumigation with methyl bromide, giving details as to: car seal, applicator arrangement, methyl bromide application, dosage, exposure period. temperature, aeration, precautions.

WRITE PESTS—DOW

Hydrocyanic Acid Poisoning—Skin Absorption

Bulletin discusses some pertinent safety suggestions with respect to avoidance of hydrocyanic acid poisoning through skin absorption.

WRITE PESTS A-C-74

BIRD REPELLENT

Circular describes product which manufacturer claims will serve as an effective repellent against pigeons, starlings, bats, dogs, cats, rats, mice, woodchucks, moles as well as crawling and flying insects that prey upon plantings and seedlings.

WRITE PESTS—PX

THE ACTIVATING EFFORT OF PYRETHRUM UPON THE GERMAN COCKROACH

Research material prepared by John M. Hutzel, of the Ohio State University, Columbus, Ohio in cooperation with the Kenya Pyrethrum Extension Service, Inc., N. Y. Supervised by Professor F. L. Campbell.

WRITE PESTS—PYRETHRUM.

NEW ANT TRAP

Manufacturer claims many new features such as no turning or twisting necessary; four openings; larger trap; contents ⅓ greater than any other competitive brand.

WRITE FOR YOUR FREE SAMPLE OF ANT TRAP TO NOTT, c/o PESTS.

PRESERVATION OF LUMBER, POLES, POSTS, PLYWOOD WITH PENTACHLORPHENOL

This bulletin gives a brief summary of the properties, use to date, and recommendations for the preservative treatment of lumber, poles, posts, and other forest products with Permatox A. This product, it is stated, has shown outstanding promise as an effective and permanent oil preservative for many wood products. Set forth briefly also, are recommendations for the effective preservative treatment of lumber, poles, posts, and other forest products with Permatox A, based upon experience to date.

WRITE PESTS—BULLETIN 43-A.

CALCIUM CYANIDE FOR RAT CONTROL

36-page booklet contains excerpts from official publications and reports of health officers throughout the world regarding use of calcilum cyanide in the control of rats. The widely differing conditions surrounding infestations, and the specific types of control for each, which are described, will serve as suggestions to health officers and others in solving similar problems.

WRITE PESTS.

FUMIGATION SAFETY RULES

Bulletin discusses fumigation safety rules with respect to mattresses, pillows, bedding, clothing and bedroom rugs, etc.

WRITE PESTS—AC No. 79.

FUMIGATION SAFETY RULE

A review of fumigation accidents of record for 1943 shows that oversight or disregard of rule to lock all doors and accessible windows, failure to place warning signs thereon and failure to post guard during fumigation account for approximately 20% of the accidents. Bulletin discusses ways and means to eliminate accidents of this nature.

WRITE PESTS—AC No. 80.

DOG-CHECK

Circular describes remedy which manufacturers claims is effective for breaking dogs and cats of their undesirable habits, that rain will not wash it off, odor will last for three weeks and can be sprayed directly on new growth. Free sample if you write on your letterhead.

WRITE PESTS—NOTT CO.

Fumigation manual. 76-page manual describes safe handling and working with "Cyanegg" and on fumigation procedure and insect control. Illustrated.

WRITE PESTS—DuPONT .

INSECT TRAPS

Bulletins describe traps for ants and roaches, with suggestions for their use.

WRITE PESTS—SOILICIDE.

The Texas Gulf Sulphur Co. has recently published a revised copy of The Use of SULPHUR in the CONTROL of TRUCK CROP and CANE FRUIT INSECTS and DISEASES. Any desiring a copy of this booklet which is for free distribution, can obtain it by writing to The Texas GULF SULPHUR Co., Second National Bank Bldg., Houston 2, Texas.

What's New In Pest Control-Personals

(Continued from Page 31)

FESTUNG EUROPA: Three soldiers in German uniforms ordered coffee at a small restaurant in Czechoslovakia. The waiter shouted to the kitchen, in Czech, "Three coffees with rat poison." One of the soldiers stood up and corrected the order, shouting to the kitchen, in Czech, "Only two coffees with rat poison, please. I am an Austrian."

"MAN OR MOUSE" THEORY exploded: Prof. J. P. Scott (Wabash College), declares the N. Y. Times, changes a mouse with a "Ferdinand-the-Bull" psychology into a furious fighter. He began by training male mice of the same parentage not to fight. This he did by lifting them out daily with forceps, stroking them gently, and replacing them. When two males schooled in this fashion were introduced, no fighting occurred. Peace was associated with handling. Hence the inhibition. These same amiable males were next trained to fight. Each was introduced to a warrior mouse, who lost no time in giving battle. Scott separated the mice before either was hurt. This was repeated until the non-fighter learned how to fight. When two ex-pacifists were re-introduced the struggle began at once. Apparently the mice had been conditioned to fight any mouse that had been placed in the pen. One mouse soon became the victor and dictator. Professor Scott concludes that "the theory of determination of social organization by social behavior is correct in so far as social dominance based on fighting of male mice is concerned."

Here comes the happy, bounding flea;
You cannot tell the he from she;
The sexes look alike you see—
But she can tell and so can he.

WASHINGTON FULL OF RATS, RESTAURANTS TOLD TO CLEAN UP

Washington (AP)—With the rat population estimated as outnumbering humans 3 to 1 here, Washington health authorities ordered restaurant owners to "clean up or close up."

—*N. Y. Post.*

DERRIS CUTTINGS

One hundred thousand cuttings of derris have been planted in Haiti, in cooperation with the United States for future rotenone insecticides. Several South American countries are receiving cuttings by aeroplane.

PIED PIPER SOUGHT

A modern Pied Piper is needed in Eire, Dublin reports. Prime Minister de Valera has been asked to map a program to rid Eire of rats, which are causing extensive damage to crops and merchandise. Rats, it is claimed, are as much a scourge today as were the snakes of St. Patrick's era.

—*Buffalo Courier Express.*

SEVEN-MILLIONTH BUG BOMB

From the start of the war to March 1, 1944, Westinghouse supplied Uncle Sam's Armed Forces with more than seven million aerosol bombs, enough to rid a billion Army pup tents of all disease-carrying insects, reports Chem. & Eng. News. Thousands of these metal dispensers are being shipped daily to the Southwest Pacific and other tropical areas to eradicate mosquitoes, flies and other insects that spread disease. Harmless to humans, the fine mist discharged from the dispenser exterminates insects in tents, barracks, tanks, airplane cabins, and even fox holes.

A war-born invention, the device probably will be used after the war to kill insects in farm buildings and homes. It may even be developed to the point that by substituting thin paint for insecticide, it can serve as a paint gun to spray furniture, automobiles and other things.

One dispenser contains a pound of insecticide, sufficient for 12 to 14 minutes of spraying, enough to "de-bug" 150,000 cubic feet of space, or the equivalent of 240 pup tents or 50 giant bombers. The lightweight steel containers are thrown away when empty, making it unnecessary to carry cumbersome spraying equipment.

Desire 1 or 2 lbs. of THALLIUM SULPHATE. This would be appreciated very much. Name your price. BOX 23, c/o PESTS.

We Offer To The Professional Exterminator

A HELPING HAND IN DIFFICULT TIMES

HIGH-KILL AMMUNITION IN THE FIGHT ON THE HOME-FRONT

HOPKINS'
REDRATSQUIL
(Trade-Mark)

POWDER OR LIQUID

Made from the genuine Red Squill bulbs, oven-dried under a temperature of 176° F.

HOPKINS' POWDERED
PYRETHRUM DUST

A by-product of 100% commercial pure Pyrethrum Flowers.

After the war is over, the Professional Exterminator will have before him the biggest opportunity of his career. The demand for his services will be greater than ever. He has abundantly proved himself the most vital link in the problem of pest control. His standing as an important public servant has achieved the plane of a respected profession.

But what of today? For today is the day of trial and tribulation. Labor shortages, scarcity of materials, government priorities, unsettled conditions—all conspire to make your job a trying one. And that is why, in these difficult times, the helping hand of J. L. Hopkins & Co. is so much appreciated by the professional exterminator.

We are not magicians. We cannot pluck out of the air all the insecticidal supplies we should like to make available. But many of our exterminator friends tell us how agreeably surprised they are with the fine help they get from us. We have always gone out of our way to cooperate with the profession. We are trying even harder in *these* days to make our friendship felt —with the supplies you need, *when* you need them, in the *high-standard quality* you need to maintain your reputation.

Call on us for your requirements. We shall continue doing not merely our bit, but our *best*, to fulfill them.

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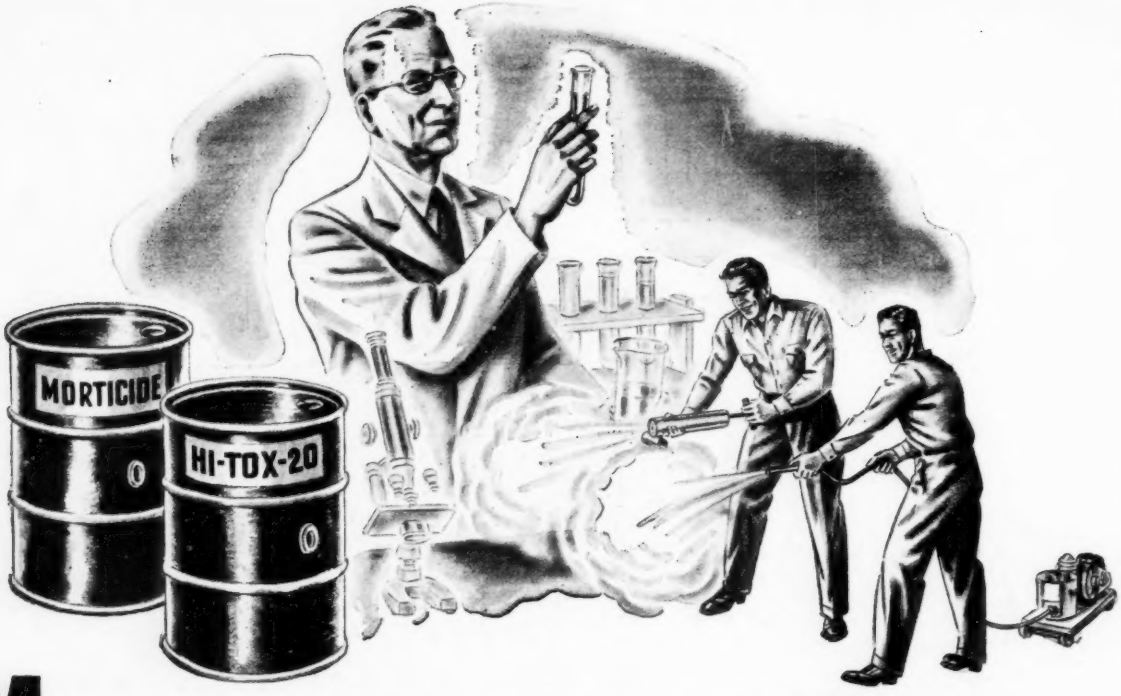

MANNING THEIR BATTLE STATIONS ON THE HOME FRONT

HI-TOX 20 and Morticide fill the need for efficient insecticide concentrates in these times of great emergency.

HI-TOX 20 is more than a substitute for Pyrethrum Extract, in its own right, Hi-Tox 20 is an efficient toxic agent for cattle and fly sprays. Its high killing power insures a quick, effective finished insecticide. Durability is another Hi-Tox virtue. Hi-Tox 20 will not separate or throw a sediment even under conditions of extreme heat or cold.

Hi-Tox 20 ages well — does not cloud or alter its composition when exposed to air. Its killing power remains at a high peak regardless of age. Above all, Hi-Tox 20 is economical. 6% of Hi-Tox 20 plus 94% oil base provides an AA spray. It is priced right!

Use HI-TOX 20 and MORTICIDE for your quality insecticides

MORTICIDE does a comparable job on crawling insects, bed-bugs, roaches, etc. It possesses the same lasting qualities and economy features as Hi-Tox 20.

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TEXAS OFFICE: The Carroll Company, 1323 Wall Street, Dallas, Texas
PACIFIC COAST OFFICES: Marshall Dill, 2465 Porter St., Los Angeles 21, Cal.
Marshall Dill, 26-28-30 Bluxome St., San Francisco, Cal.